

satisfied there was reasonable flexibility in the work to allow for academic interpretation.

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News in Brief

Three into one will go

A proposal to merge three Scottish further education colleges into one is to go before Borders Regional Council's education committee. There is already one college council for the three institutions, Galashiels Further Education College, the Borders Agricultural College, and Henderson Technical College, and it has reported that the three college principals are generally favourable to the scheme.

Alliance reviewed

A full-scale review of the structure and funding of the Education Alliance, the umbrella pressure group of trade unions and voluntary groups dedicated to preserving and extending educational opportunities has been launched.

New helmsman

Admiral Sir James Eberle, aged 56, has been appointed the next director of the Royal Institute of International Affairs. He will take over next January from Mr David Watt who is standing down to concentrate on his research interests. Sir James, once tipped as a possible First Sea Lord, is the first naval man at the helm of the Institute, better known as Chatham House.

Help available

Potential 1984 higher education students in need of financial assistance can obtain information about a range of sponsorships being offered by 100 industrial and professional organizations and Government departments from the latest annual guide published by the Careers and Occupational Information Centre, *Sponsorship 1984*.

Yeast extract

The possibility of easily accessible computer records of almost 2,000 strains of yeast and their characteristics is being studied by the Government Chemistry Laboratory. Details of strains with specific characteristics can be obtained by industry at £20 a search.

Admin diploma

Freston Polytechnic has initiated a new two-year diploma course in bilingual administration, approved by the Business Education Council and intended to train secretaries and administrative staff in international companies, tourism, import-export and shipping. One or two modern languages are combined with business studies, office administration and new technology, with a period in an office either in the United Kingdom or abroad.

Correction

The Home Office is giving £250,000 a year to a new police training centre at Brunel University, and not as mistakenly printed in last week's *THES*.

EEC rules affect 46 institutions

by David Jobbins

Ministers are interpreting as strictly as they can a court decision that an EEC student studying to become a teacher in the UK was entitled to a maintenance award and to pay home student fees. In the case of Mr Tariach MacMuir, an Irish student studying to be a teacher at St Mary's College, Richmond, the court held last year that migrant workers were entitled to be treated as home students when following a training course in a vocational college and were entitled to qualify themselves for a further job.

Jon Turney reports from the British Association for the Advancement of Science in Brighton

Human ability being misused

The new technologies of microelectronics and information technology satisfy all the requirements for a revolution in the economic system, Professor Chris Freeman of Sussex University's science policy research unit said in his presidential address to a special session on technology and the future of work. They offered a rare combination of a drastic fall in costs as well as vastly improved technical performance.

But was this cause for optimism or pessimism? Other speakers stressed that the outcome was not fixed. It would depend on the attitudes of scientists and engineers designing other people's jobs as well as on Government technology policy.

Professor Howard Rosenbrock, of the University of Manchester Institute of Science and Technology argued that the potential of the technology gave cause for optimism, but this could easily be smothered if it was developed in the same way as earlier generations of machines.

He condemned the "fragmentary trivialized jobs" now so widespread as a grotesque misuse of human ability. It was tempting to see the replacement of such jobs by automated machines as a boon, but this ignored the process by which such jobs were created, and by which a multitude of similar jobs was

being created now, he claimed. While it was now possible to design new systems which accepted human skills and collaborated with them instead of replacing them, there was little interest in doing so. "Modern technology is being developed in a spirit that has remained unchanged for 150 years," he said.

In Professor Rosenbrock's view, this was not due to the needs of capitalism, but to the scientific technological outlook itself. He believed any attempt to follow an alternative, skill-enhancing path would lead to a conflict with the current scientific outlook and values. "He is likely to insist that the experts can only disagree validly with his programme when it gives an incorrect diagnosis. If he can improve it sufficiently, the experts will always agree, and if he always agrees he is redundant," Professor Rosenbrock concluded.

If this was a product of the scientific world view, as Professor Rosenbrock believed, there was little prospect of realizing the glowing picture painted by Dr Philip Armstrong of the Technical Change Centre. He finished an outline of the effects of technology on work with a call for new ways of using new tools.

"As rich society has the option of

choosing its technology to fit human needs," he said. "Research and development could be aimed at extending human capabilities, rather than replacing them by machines." Rosenbrock's point precisely. Even more appealingly, Dr Armstrong believed it was also quite possible to direct technology along lines which enabled work to approach leisure, rather than enabling work to be replaced by leisure.

This was optimism worthy of the arch prophet of information technology, Mr Kenneth Baker, the minister for information and technology, but sadly Dr Armstrong gave no examples.

However, Mr Baker gave a large catalogue for examples of aids for the disabled in his paper on "The compassionate face of information technology". Microprocessors would help the blind and deaf to communicate, help cripples walk and permit people in wheelchairs to do useful work.

Here it was impossible not to see information technology as a good thing, but this was a far cry from the conflicts over jobs and the economic warfare outlined by other British Association speakers.

The flavour of the rhetoric recalled Professor Rosenbrock's comment: "We do not know where we are going, but it is essential to get there as fast as we can."

Fashioning clay models worlds apart

The Bible and Dr Graham Cairns-Smith tell us that we were fashioned from clay. But their arguments are rather different. Dr Cairns-Smith has been thinking about technology, life, and evolution.

This was not surprising, for we ourselves high technology organism, as he pointed out to the biology section. In fact all living things are made of "high-tech", in the sense that none of the parts was any separated from the whole. So how do they get there?

Evolutionary theory is pretty sophisticated these days in accounting for the way living things change. But it is down at the primal origin.

The most perplexing thing, Dr Cairns-Smith argued, was that the design of the central biochemical workings was more high tech than anything else. You needed all the bits to make any of the bits. Specifically, he needed proteins coded for by a genetic material, DNA, to reproduce the DNA which ordered the production of the next generation's protein molecules. It was very hard to see how such a mechanism could evolve in simple steps.

The answer, Dr Cairns-Smith believed, was that there must once have been primitive "low-tech" life forms for the mechanism we now see to kick on. Not simpler versions of the same thing, but a different system, perhaps made from quite different materials.

In fact, the most likely candidates for the components of the original low-tech systems were minerals that crystallized from solutions of small molecules in a water, better known as clay.

Dr Cairns-Smith could show diagrams and slides to illustrate how clay matrix could replicate information and even how this system could evolve until "taken over" by genes as we now know them.

The snag was, that although some experiments could be done to make the idea more plausible, the overall theory was unlikely to be open to test unless you had a fresh planet and a few hundred thousand millennia to spare.

Overseas aid critics criticized

Professor Robert Cassen of the Institute of Development Studies at Sussex launched a blistering attack on academic critics of overseas aid. His main target was Professor Peter Bauer of the London School of Economics, the author of several recent articles arguing that aid is of no benefit to the donor nor the recipient.

Professor Bauer, he said, based his views on anecdotal evidence of the occasional failed project and on a priori theorizing which has little basis in reality. He accused Professor Bauer and his collaborator, Professor Basil Farney, of errors, ignorance of what aid actually does and fallacious reasoning.

It was regrettable that arguments like theirs could gain currency, but it more reflected the deplorably low standard of public debate on aid issues. Professor Cassen argued strongly that the growing interdependence of the world economy meant that aid was in everyone's interest. In the end, the West's prosperity might depend on it.

Courses are made to measure

An unusual education and training consortium in the West Midlands is to get official Government encouragement at an inaugural conference at the end of October when Sir Keith Joseph, the Secretary of State for Education, will attend.

Three colleges, a polytechnic and a university have collaborated for what is believed to be the first time to provide a "tailor-made" training package on demand.

A centre of excellence based at the University of Warwick has been set up with the PICKUP (Professional Industrial and Commercial Underpinning) scheme and more than £200,000 from Coventry City Council. Two academics have already been appointed and

another two are to come from industry. Mr David Warner, the coordinator of the consortium said the main objectives were to provide one single office for all inquiries; to assist in identifying, training needs; to sell higher and further education; to use the services of 1,500 academic staff, institutional equipment and residential accommodation; to offer programmes with professional associations; to make bids for outside money, such as the European Social Fund.

The institutions involved are the University of Warwick, Coventry Polytechnic, Henley College of Further Education, The Hill College of Further Education, and Coventry Technical College.

Private colleges put to standards test

by Ngao Crequer

A British Accreditation Council is to be set up next month to inspect and validate independent colleges of further and higher education.

The new body will aim to improve standards in the private colleges and curb those which provide poor courses and worthless qualifications and charge high fees, particularly to foreign students.

The initiative came from the British Council, which chaired the working party looking into the scheme. The council will be independent of the

Government but the Department of Education and Science will advise on inspection procedures.

The new council will consist of one nominee from each of the British Council, the Committee of Vice-Chancellors and Principals, the Council for National Academic Awards, the Committee of Directors of Polytechnics, the United Kingdom Council for Overseas Student Affairs, the National Institute of Adult Continuing Education, the Royal Society of Arts and the London University entrance school and examinations councils.

It will probably be chaired by an academic and will have a small secretariat. The council will appoint a body or part-time inspectors to visit colleges requesting accreditation and these are likely to be retired principals of colleges or members of Her Majesty's Inspectorate.

The need for the new council has arisen because the DES has ceased to recognize or inspect independent further education colleges. Many foreign governments have complained about some of the worst colleges and the ones with a high standard would like to

use out the "mavericks" which give them a bad name.

The council will eventually be self-financing and will be paid for by the 200 colleges, seeking accreditation. In the meantime it hopes to attract funds from a charitable trust.

The founding groups stressed at the beginning that the council should be seen to be impartial, independent and with authority and members should be nominated by recognized bodies, with no direct or financial involvement. In some cases the council will authorize other bodies to do inspections for it.

Protest sent to Moonie publishers

by Paul Flather

An Oxford academic has protested to an American publishing company for asking him to write a review without explaining that it was directly linked to the Unification Church of the Rev. Sun Myung Moon.

Dr Bill Newton-Smith, a fellow of Balliol College, was asked by Paragon House Publishers to assess a manuscript entitled *Knowledge and Reality*. His suspicions were aroused because he offered £250 (£160 for the job, six times the normal rate).

The *THES* has confirmed that Paragon House, which has offices in New York and Washington, was a division of the International Culture Foundation founded by Mr Moon.

Dr Newton-Smith has written to Professor Frederick E. Sontag, chairman of the editorial advisory board of Paragon House, at Pomona College, Claremont, California, saying that he does not want anything to do with a publishing house associated with the Moonies.

"I object in the strongest possible terms to the fact that this was not made clear in your letter," he says, and asks for an account of the exact connexion between Paragon and the Moonies.

Mr Richard Wojcik, shortly to become the publisher of Paragon House, said there had been no attempt to cover up or obfuscate the links. "The foundation has been around for more than 10 years and its sponsorship is well known," he said. The editorial board was made up of academics independent of the church.

Training places

continued from front page

Public sector union leaders are in difficulties because although they do not want to be seen to oppose a scheme giving hope to thousands of youngsters who would otherwise be unemployed, they are also committed to fighting job cuts and efforts to depress wages. They fear that some authorities might be using the YTS as a source of cheap labour and a weapon in the drive to reduce labour costs.

In its handbook on the YTS, published today the TUC calculates that employers could make a "surplus" of as much as £8,000 for each group of five trainees.

relieved high quality applications are pouring in. The pressure is really on. Those who cannot get the grades are turned away.

In the sciences it was more patchy. There were excellent candidates in computing and some of the biological sciences, and good applications in electrical, electronic, civil and mechanical engineering.

At Salford applications have increased by 11 per cent and so higher grades have been necessary. Some departments are full but they will go to clearing in chemistry (asking seven points), physics (eight), biology and geography (nine). (A grade A earns 5 points, B four points, and so on.)

At Sheffield applicants with fewer than the required grades have been rejected. There are no vacancies left in arts, humanities or social science subjects except for a limited number of spaces in urban studies.

And there is virtually nothing left in sciences of medicine except for a few vacancies on courses in chemical and



"We call it an alien plant because we can't seem to find a place for it."

Lower degrees are high risk

Graduates with lower second class degrees or less are a high employment risk because they are less likely to qualify as accountants, according to the Institute of Chartered Accountants.

Its report published this week is based on a working party study into the educational background of all 1982 examination candidates. It warns employers that there are four categories of students who represent a considerable employment risk.

One is composed of students with a lower second class degree or worse, particularly those with a wholly relevant degree or a business studies degree. According to the ICA's figures only 44 per cent of relevant graduates with lower seconds passed the 1982 professional examinations, and only 28 per cent of those with a third class or pass degree.

"Graduates who have spent three years studying accountancy and then achieved only lower class of degree have probably demonstrated that accountancy is not their forte."

A second group unlikely to do well in the professional examinations is made up of students who received a University Central Council for Admissions rating at A level of less than nine points.

The third group which employers are warned against are students who achieved no more than a pass in a foundation course.

The fourth group comprises those students whose performance in English and mathematics O level as well as maths A level was indifferent.

Local cooperatives considered for adult training schemes

The Manpower Services Commission is considering a local collaborative model, along the lines of the Department of Education and Science's professional industrial and commercial updating (PICKUP) programme, as part of any new training initiative it might set up for adults.

It is still analysing the responses to its paper *Towards an Adult Training Strategy* and will hold its first tentative discussions on proposals next month, but one line of thought which has already emerged is to provide modest resources so that local cooperative initiatives can identify training needs.

The idea would be to prompt local providers, which would include the industry training boards, large employers and MSC skillcentres to get together with industry to talk about training needs.

Such a scheme would in effect build upon the PICKUP scheme which has been encouraging local networks of educational institutions and local education authorities on a cooperative basis to provide for updating and training courses adapted to industry's immediate needs.

With this in mind, the MSC is clearly looking towards closer collaboration with the DES over an adult training strategy with the MSC acting as a catalyst rather than as the initiator of programmes specified by itself. In this respect it is looking away from the training.

Plea for YTS travel increases

Scottish education authorities are to press the Manpower Services Commission to increase travel allowances for young people on the Youth Training Scheme.

The Convention of Scottish Local Authorities after representations from Lothian Region, agreed to ask that travel expenses above £2.35 be reimbursed, instead of the present £4.00.

The limit has remained static for nearly five years, over which period according to COSLA, travel costs have risen sharply and the retail price index has gone up by 75 per cent.

A report from Lothian's administration department says the YTS allowance of £25 a week, already condemned as inadequate by almost every body except the Government, is supposed to contain an element for travel expenses.

Education officials fear that the fact that only about £4.00 can be claimed discourages longer journeys to workshops, employers and colleges, and discriminates against youngsters with special needs who generally have further to travel. On the other hand, young people who are able to walk or cycle are favoured because they still get the basic travel allowance.

Lothian also reports that some further education colleges which ran free buses to collect students from outlying districts until early last year now have to charge 50 pence a day return fare.

For other young people under 18 attending college courses, Lothian's normal arrangements are that travel costs over £1.00 are claimable from the region for full-time or block-release courses (the limit is £2.50 a week).

Student cutbacks postponed

by Patricia Santinelli

Substantial cuts in intakes to non-BES courses at 16 voluntary colleges have been postponed until 1985 by the Department of Education and Science.

But cuts in staff amounting to 80-90 posts and a £1.8m reduction in the colleges' income for next year, designed to bring the colleges in line with the public sector, will be implemented.

The 16 colleges involved have been given until September 30, an extension of the original deadline of one month, to tell the DES how they will implement the cuts.

Not included are three joint-funded colleges, West Sussex and West London Institutes and Derby Lonsdale; Newman, Birmingham which has a special arrangement; St Mary's Fenham which is closing; De La Salle, Manchester, whose future is uncertain; and Trinity College, Carmarthen.

The decision to postpone the cuts in student intakes of around 400 as well as reduce the loss of staff, originally intended to be one in eight of all posts, was taken by the DES after strong representations from the Association of Voluntary Colleges.

The reduction in staff posts, which will be implemented over two years, is intended to bring down the colleges' student:staff ratio of 11½:1. But the reduction is likely to have an uneven effect as some colleges have been asking to lose more posts than others.

The National Association of Teachers in Further and Higher Education took a delegation last week to the DES to protest about the staff cuts and the lack of consultation. The NATEF says that although it has opposed the staff cuts, it is well aware that the voluntary sector should be brought in line with the public sector. But it wishes to ensure that in the process they are not treated more badly.

Moreover, the reduction in income which amounts to 4 per cent on £45m will bite more deeply in some institutions and this effect is likely to be reinforced when the DES abandons its new funding approach in 1985. The new approach had been designed to allow colleges to bid for extra funds over their base estimates.

The cuts in student intakes to non-BES courses is being set in the context of an overall rise in student numbers of 3.5 per cent. Nevertheless, it will amount to the loss of 1,000 places, or one in seven of all non-BES places at the 16 institutions which have an approximate total of 16,000 places.

There is some concern among the colleges that this may herald a reversal of diversification and pushing the voluntary colleges back to becoming solely teacher training institutions, although there is no policy indication at present that this may be so. In fact no pattern will emerge until the Advisory Committee on the Supply and Education of Teachers reports at the end of next year on teacher training numbers for 1986 onwards.

Universities full up and polytechnics snowed under

continued from front page

Most universities report that this year is even worse than last and some, like Bristol, will have no places left to go into clearing.

At Warwick all social studies are filled. In the arts there are only a few places left in French, but the university will go into clearing in the BEB, where they were given more places and there are vacancies in mathematics.

In the sciences there are one or two places left in engineering, physics, chemistry and biological sciences. Candidates will need a minimum University Central Council for Admissions score of nine points (ie three Cs).

Lancaster has only a dozen vacancies in all. "We have been very strict about grades. The position is similar to last year except we have had many more inquiries from teachers, pupils and parents, indicating their very great concern at a much earlier stage," an official said.

A Leeds official said: "In the arts up-

control engineering and in materials, which have gone to clearing.

Applications to Manchester University were up 3 per cent on last year when the adjustments to student intake were made. There are hardly any vacancies in arts, which have gone for clearing, but a few science, economics and social studies.

There has also been sizeable rises in applications to Scottish institutions. Applications to Stirling University have risen by 21 per cent with 10,000 applicants for 360 places. The university is still lobbying the University Grants Committee for an increase in its intake which was cut by a quarter in 1981.

Dundee has about 11,000 applications for 600 places, and has already gone into clearing for civil engineering, architecture, town and regional planning and the pre-dental year.

Glasgow has about 19,000 applications for 2,150 places, and reports that many applicants have very high qualifications. There are 15 applications for

every place in an Academic Exchange scheme, and in some cases already for each place.

Sheffield has 16,800 applications for 1,530 places. Glasgow 15,500 applications for 1,000 places. Heriot Watt has 9,000 applications competing for 590 places.

Applications to Robert Gordon Institute of Technology, a students' largest central institution, fell by 600 from last year to 4,000, and only 900 places.

Aberdeen University has measures in place for a target intake of graduates. But it reports a major influx of pupils. "They are obviously in effect the water," said an official. "We still have a lot of place students largely because much larger numbers would have expected to be in the sixth year at school."

Students in West

en strongly criticized the commission's report of 200 pages, dealt with policies towards foreigners generally, and only a minor part was devoted to students. But the exchange service declared that the government was in danger of jeopardizing its reputation towards foreign students.

The students exchange service says there is no justification for the commission's fear that foreign graduates from developing countries intend to stay in Germany permanently. Only 21,000 of the foreign graduates employed in Germany came from such countries. Most of them got jobs when Germany was short of qualified people.

Nor, according to the exchange service, are notably less academically successful or study longer than Germans. Moreover, 90 per cent of those foreigners who dropped out did so in the first phase of their courses. Besides, the service points out, the authorities could withdraw residence permits from foreign students who stayed too long.

The commission's report of 200

Overseas news

Africans allowed no fees credit

from E. Patrick McQuaid
WASHINGTON

The ambassadors representing Nigeria, Ghana, and Guyana have been notified that because of their poor credit ratings, American colleges and universities are being urged to enrol from those countries only students who pay their tuition fees in advance.

The National Association for Foreign Student Affairs, says this action is a result of Nigeria's inability to transfer promptly funds to its roughly 20,000 students in the United States. The Nigerian Embassy attributes the problem to red tape but American analysts say Nigerian banks are purposely delaying overseas payments because of the country's drastic financial situation, fuelled by the global oil glut.

Some 1,300 American institutions are members of the National Association for Foreign Student Affairs, whose representatives say the measures were taken after complaints from member schools that they were owed thousands of dollars from these particular foreign nationals.

The University of Maryland at College Park, just outside Washington, reported unpaid bills from Nigerians totalling \$70,000 last year. Collection agents there said they negotiated with the Nigerian Embassy "until we were blue in the face." The university adopted a policy last spring requiring Nigerian applicants to forward a full year's deposit on tuition, fees, and living expenses averaging \$11,000 unless they could prove their funding source was outside of Nigeria.

In Lagos, the American Embassy is now requiring student visa applicants to show that they have made advance college payments before issuing travel papers, according to the US State Department.

A foreign students advisor at Washington's Howard University estimated that 10 per cent of the university's 546 Nigerian students would not be able to register for the autumn term because payments from their home banks had not been processed.

Foreign nationals in the States on a student visa violate the terms of their papers if they are not enrolled full-time at an American institute. Attorneys for the Federal Immigration and Naturalization Service, an arm of the justice ministry, say these students are subject to deportation.

Draft evaders 'must fend for themselves'

from E. Patrick McQuaid
CAMBRIDGE

All in the space of one week the president of Harvard University has said that male students evading the military draft registration can fend for themselves if it costs them their financial aid, the government has said it will delay enforcement of the controversial new ruling and three American churches have said they will compensate conscientious non-registrants for any burdens imposed by the government or their schools.

In a prepared statement, Mr Derek Bok, the president of Harvard, said the university would not offer scholarship funds, subsidized loans, or subsidized employment to compensate for the loss of federal support to those failing to comply with the new law which requires young male aid applicants to report if they have registered with the Selective Service.

Last year the Congress approved an amendment to the Department of Defense Authorization Bill, proposed by the department of education, prohibiting non-registrants from receiving federally subsidized grants and loans to cover college expenses.

The law took effect on July 1 but enforcement was delayed until September 1 after a lawsuit in Minnesota sparked heated debate within the justice ministry. The federal court in Minnesota determined that the regulation was in violation of rights guaranteed in the constitution but the supreme court's reluctance to hear the case until next session has put the matter in limbo.

The high court will decide during its autumn term if it will hear the case. A decision may not come until next year.

In a twist not unusual for particular cases, the government's position which effectively means non-registrants may start their own classes without fear of reprisal, extension is until October 1, while Congress proposes to advance as effective date.

Mr Bok also voiced doubts about the constitutionality of the law and joined many other major American universities which have said that while they may question the wisdom of the government, they will obey.

"In our view the university should be most reluctant to offer assistance or encouragement of any kind to students who violate the law," Mr Bok said.

Mr Bok has struck a diplomatic compromise, however, by making Harvard students who choose to ignore the regulation eligible for available campus jobs at regular compensation rates and for market-rate loans. The source of these funds is not tied to federal funds.

"One can appreciate the courage of those who are willing to live by their principles," Mr Bok added. "But individuals who choose to stand on their convictions and disobey the law must normally bear the consequences. Such expressions of conscience are highly personal and one cannot expect others to pay the cost."

Federal aid for Harvard's 15,000 graduate and undergraduate students totals about \$35m annually and roughly 9,000 students receive federal aid in grants or loans. There are no figures on how many students have registered for the draft nor how many of these are receiving federal aid.

Israeli institutions 'cannot pay August salaries'

from Benny Morris

JERUSALEM

Israel's university heads said this week that the institutions of higher education are broke, cannot pay salaries for August and probably won't be able to open for the coming academic year.

This announcement, made at a special press conference in Jerusalem, came hard on the heels of a Treasury decision to cut university budgets across the board by 10 per cent as part of a major budget slash affecting all government ministries.

Some 70 per cent of the budget of Israel's six universities and the post-graduate Weizmann Institute of Science come from the state.

The Treasury decision is not final, and education minister Ze'evulun Hammer is fighting it, as well as other education budget cut demands in the cabinet.

At the press conference, Shlomo Gazit, the president of Ben-Gurion University in Beersheba, said that a further decline in the level of teaching and research at the universities would mean that Israel would lose its qualitative edge in science and technology over the Arab states.

This would endanger Israel's security, said Gazit, a retired Israel defence forces major-general and former head of military intelligence.

Using the continuous devaluations of the Israeli shekel, the Treasury over

the past year "shortchanged" the universities by 14.5 billion (about \$400m) said Gazit, who also claimed that the Treasury has withheld money to cover the recent university teachers' pay rise award.

The universities have been forced to take commercial loans from the banks and are paying high interest rates.

Bar-Ilan University rector Professor Michael Albeck said that even if the 10 per cent budget cut was not in the end implemented, the universities might be forced to "close their doors and hand over the keys to the government" because of the cumulative effects of constant cuts in past years.

Speaking on the theme of Israel's "qualitative edge" over the Arab states, Gazit said that in 1970 there were 15,000 students in Arab states studying computers, science and technology compared with 15,000 in Israel.

In 1980, there were 90,000 Arab students in these fields as compared with 20,000 Israelis. The position is expected to continue deteriorating said Gazit.

Hebrew University president Dan Patinkin said that there was a "very real danger of the system of higher education sinking into mediocrity."

He pointed out that many Israelis aiming for higher degrees go abroad because they see the Israel universities cannot keep up with the latest, costly scientific advances. Once abroad, many of these scholars don't return to Israel.

Academics lack aggression and competitiveness down under

from Geoff Maslin

MELBOURNE

The most noteworthy differences between the standard appointments of teachers in five-year and during that time the appointments have to prove that they are a competent teacher and researcher. After five years, the chances are that only another five-year contract will be offered.

It was different to Australia, where Mr Matolcsy said. "Anyone who has done a lot of things over the years and then receive a permanent appointment," Mr Matolcsy said. "It is a different kind of security."

Mr Matolcsy noted that compared with American universities, those in Australia offered lesser financial rewards. He called for institutions to give thought to offering "packages" to people, rather than straight salaries.

The lack of job security in America seemed to provide an incentive to be a dynamic teacher and active researcher, Mr Matolcsy suggested. He pointed to a similar situation at the London Business School where tenure was only available at a professional level. Moreover, he said, the renewal of contracts and granting of promotions were dependent on teaching ability and research output.

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A modern testament of faith

The town of Torun in north west Poland contains three immense Gothic churches: St John's, St Jacob's and the church of Our Lady, all built between the thirteenth and fourteenth centuries.

Each reflects the combination of the Western and Eastern European traditions; the former's rich stone ornamentation, the latter's bolder and more sparing outlines. The UNESCO, in a flourish of aesthetic bureaucracy, has designated all three "outstanding examples of world culture."

An exhibition of photographs of the three church interiors has just ended at Coventry (Lancaster) Polytechnic. Called *Prayer in a Gothic Cathedral*, it was previously on show in two monuments to twentieth century religious architecture: Coventry Cathedral and Liverpool's Metropolitan (Roman Catholic) Cathedral.

The photographer, Tomasz Sobiecki, was born in Torun 31 years ago. Now he teaches English and geography at the local high school and in his spare time - not much at present with a pregnant wife and infant daughter to look after - takes photographs.

During the recent troubled years in Poland, the economic situation has worsened and photographic materials, including film, have been in increasingly short supply. The exhibition that has just ended at Coventry took Mr Sobiecki seven years - from 1973 to 1981 - to complete. Another exhibition, this time concentrating on a crucifix in one of the Torun churches is provisionally planned for next year.

Mr Sobiecki's links with Coventry stem from a meeting 10 years ago with a Coventry (Lancaster) student, Gareth Evans. Both were student delegates to an international student conference in Poland. The Polish student wanted to practise his English, and the two men continued to correspond while Mr Evans became a lecturer in the polytechnic's management studies department.

After *Prayer in a Gothic Cathedral* was exhibited in two Polish churches, Mr Sobiecki wrote to his friend in Coventry to try and arrange for it to go to England. While arrangements were getting under way, marital law intervened. Liverpool Cathedral agreed to take the exhibition in February this year, but at that stage Tomasz Sobiecki could not get permission to leave Poland.

Meanwhile the 36 photographs, many of them the same size as substantial paintings, had been brought out of



Gothic crucifix in Torun church, subject of a proposed exhibition.

the country by a strange coincidence. Once Liverpool and Coventry accepted the exhibition, Gareth Evans contacted various British firms exporting to Poland, asking if they would bring the photos back with them. Although the Polish authorities had given all the necessary permits for them to be brought out, the companies would still have been involved in additional red tape, and all of them refused to help.

With little hope of sending his exhibition to its now-promised venues, Tomasz Sobiecki left his house for work earlier than usual one day, and passing a church saw a lorry parked in front of it.

On the side of the lorry, written in English, were the words "Medicines for Poland". Inside, in the passenger seat, was the navigator: a young woman from Nottingham who turned out to be of Polish extraction.

He went up to her, and asked if the lorry - there to supply food and medicines from a British - called agency through the Polish church - would take his photographs back to England. "I had no guarantee that the photos would be delivered in good condition," he recalls. "But I had nothing to lose."

She wanted to know if he had permission to export the photos, which he had. He went back home, collected the photos and official documents to go with them, brought them back to her, and the lorry drove off. The whole matter, he says, took less than five minutes to arrange.

The photographs arrived in Britain

From Torun to Coventry - Karen Gold looks at the work of Polish photographer Tomasz Sobiecki

undamaged, and were passed on to Gareth Evans, who proceeded to set up the display in Coventry Cathedral. By this time it was April, two months after Sobiecki had been due to come to England. Back in Poland, he knew nothing about the exhibition: it took several months after he put the photos on the lorry before he even heard that they had arrived.

Eventually, in early July he came to Britain, and to the polytechnic where his exhibition moved later that month. While it was on there, he divided his time between the photographic laboratories and photography section of the library, arriving early in the morning and leaving only when the buildings closed.

As well as experimenting with some new film for the polytechnic's technicians, it was the first time he was able to use the more expensive and sophisticated materials necessary to work in colour: all his pictures for this year's ex-

Candlelit stairway in Polish church, from this year's exhibition.

hibition and next year's are in black and white.

The pictures in this year's exhibition were planned after long discussions between Sobiecki and staff at a Roman Catholic seminary in Poland. They are divided into three groups: the first suggesting the impact of Gothic architecture, its symbolism, spaciousness and silence; the second shows people becoming familiar with the church, lit by candles in prayer; the third through a collection of symbols is a reflection on the Christian interpretation of human life.

In the exhibition guide, it is suggested that against Poland's turbulent history the photographs convey Sobiecki's search for tranquillity and introspection in stark contrast to

events outside.

The exhibition planned for next year concentrates on a single huge crucifix in one of the Torun churches. The pictures will be hung in long ranks in Coventry Cathedral next Easter, lit both by candles and modern lights, and enhanced by the music of a modern Polish composer: Penderecki's *St Luke Passion*.

The music is an additional element, but the combination of modern and Gothic is still the central metaphor of Sobiecki's work. "Photography is a modern artistic language," he says. "The Crucifixion took place 2,000 years ago. Therefore I want to show this subject using a modern language, which will be easier to understand for people of our time."

Felicity Jones reports on the 'crash course in culture' run at Cambridge for IBM employees from all over the world

Programme with a different kind of input

Social psychology, modern classical music in the morning followed by astronomy and Shakespeare's *Julius Caesar* in the afternoon and a visit to a performance of the play at Stratford-upon-Avon the next day would provide a concentrated dose of culture for most students. But maintenance engineers on the IBM course at the University of Cambridge seemed to take it all in their stride.

From the point of view of both the company and the university's extra-mural department the programme, now in its seventeenth year, has provided the kind of education which they want to promote and which, with the growing emphasis upon continuing education, can be seen as a model of its kind of in-service training. For the company the course carries out "the motto for the 1980s" given by the chairman of the board of IBM World Trade Corporation: "The most valuable managers of all will be those who have learnt how to learn."

While for the university's board of extra-mural studies, the programme has managed to achieve the right balance between professional, continuing education and a broad liberal general study which has been the hallmark traditionally of adult education.

Most of the men (women rarely go on the course because they are poorly represented within the company itself) came into the company as customer or "field" engineers, who would go out and service their customer's equipment, mainly computing equipment. They will have worked their way up the career ladder and will be managers

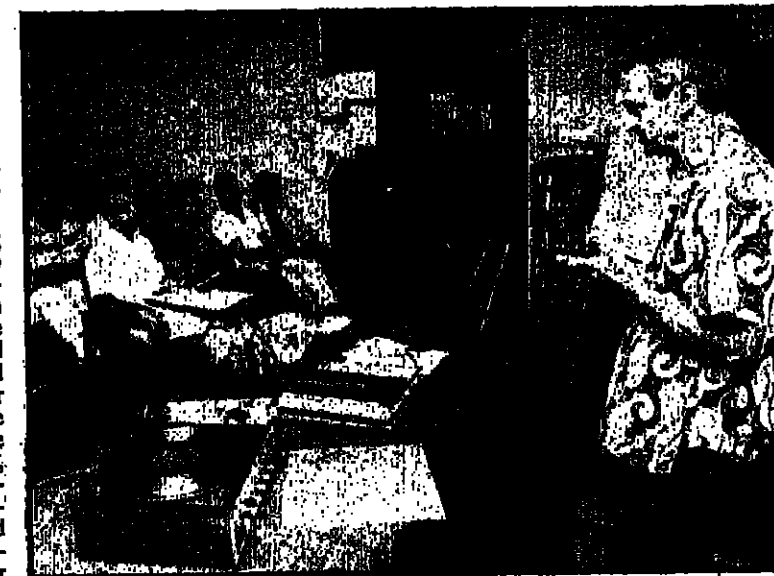
who are considered to have "HMP" or higher management potential, as they say in the company's jargon.

Over the years a well-oiled screening procedure for selecting the 30 or so participants in the seven week Cambridge programme has evolved. In reality, IBM is a loose conglomerate of individual national companies and each year a country will put forward several candidates who they consider have HMP and would benefit from the course. Later in the year, Dr Leslie James, the course academic director, and Mr Michael Allen, academic administrator and director of the Cambridge department, travel around Europe holding lengthy two-hour interviews with the candidates to discover who would be able to cope and profit from the strenuous summer school which is held on campus at Churchill College.

This year the participants were drawn from Venezuela, Thailand, Japan as well as Germany, Sweden and the United Kingdom. And for the first time two participants from the United States took part.

Most of them will never have had any experience of higher education (although there was one graduate participating this time) and will have never been inside a college or university. This makes their period at Cambridge a unique and in some cases, traumatic and life-changing experience. It is said within IBM that you can always tell who has just returned from the programme by the wild ideas which they suddenly try to introduce back at work.

The social psychology lecture given



Music lectures form part of the IBM course curriculum.

by Mr Anthony Storey, the rugby-playing subject of his brother's novel *The Sporting Life*, provided plenty of ammunition in this direction. The theme of the morning lecture was how to relate better to other people, such as the boss, by finding out their reactions to you through the Rogerian, as opposed to the Freudian, method of psychoanalysis.

The notion of using techniques of psychoanalysis on maintenance engineers back home in the company provoked some surprisingly hostile reactions from some of the participants. One fiery, red-headed Italian from Naples succinctly summed up the feelings of the camp when he remarked that IBM was in the business of making money, not tending sick people who ought to go to hospital for psychiatric help.

Yet another said he knew somebody who had been on the Cambridge course and had come back to his company and tried out the techniques on a colleague and had done "irreparable damage".

But on the whole, most of those on the course thought that understanding methods for relating to people was an essential part of the mental equipment of being a manager in IBM. The company itself runs counselling sessions and carries out regular feedback exercises anyway to ensure that nobody is harbouring grudges which could be detracting from their work. There is an *esprit de corps* at IBM which very few on the Cambridge course would have questioned.

The department of extra-mural studies has a free hand more or less when it comes to devising the course except

that it is agreed that it will not touch on computing or management. Otherwise the department has a free rein to choose what books are discussed (*Animal Farm* and *The Great Gatsby*), other topics covered (from "Industrial society" to bird migration); and who should be invited to come as outside speakers, as well as study-related excursions to Snape Maltings or to an astronomy laboratory.

Guest speakers this time included a heart transplant surgeon from Papworth Hospital, a director of the National Farmers' Union, the chief constable of Sussex and head of the earth sciences division of the British Antarctic Survey.

Mr Michael Allen, the director of Cambridge extra-mural department believes that the liaison with IBM shows what extra-mural departments can do in the way of continuing education without restricting it to purely vocational-orientated training. Other companies are showing an interest in taking something similar on board.

They are directed towards Mr Brian Robinson, a director of United Kingdom IBM who went on the course himself as a middle manager before becoming a director of the company. He says that, impossible as it is to put a value on the programme, the company thinks it has been a worthwhile investment to develop people's skills on a wider basis. Those managers who have been on the course are better equipped to talk with their customers.

It is an enlightened, if expensive, view to take of education which few companies, even multinationals, seem to be prepared to invest in. To put 35 senior managers onto a leafy campus for seven weeks at the company's entire expense is an enormous investment but one which IBM has found pays dividends. It intends to continue the association with the University of Cambridge.

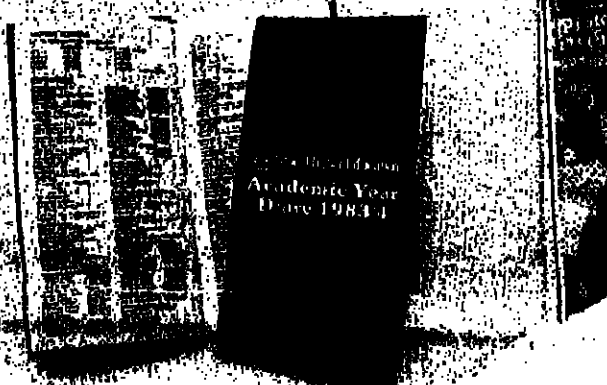
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Ngaio Crequer, John O'Leary and Peter Scott report from

Take your partners to task

UNIVERSITY/INDUSTRY PARTNERSHIPS

Tensions between academics and industrialists leading to relative isolation and widespread misunderstandings were confirmed as a worldwide phenomenon at sessions of the university/industry partnerships group. But there were also plentiful examples of a new spirit of cooperation and a determination among the delegates to break down existing barriers.

Naturally, the group, chaired by Sir Henry Chilver, vice-chancellor of the Cranfield Institute of Technology, represented the converted. But successive speakers reported a growing realization by governments as well as universities and industrialists that a partnership was now vital to economic success, and was in the interests of both sides. The difficulty was in bringing them together and evolving a mutually advantageous relationship.

Professor Guy Denielou, president of Compigne University, in France, warned particularly against over-simplified solutions which would appeal to politicians but be ineffective. He listed 11 areas of cooperation in his own institution, all relatively unimportant in themselves but contributing to a valuable system.

Both the universities and industry were in crisis, he said: their traditional methods threatened by a technological revolution more significant than any change since Neolithic man ceased to be simply a hunter and started an agrarian society. Whole industries, both efficient and inefficient, were being superseded by competition impossible to combat and within the universities the new technology encouraged interdisciplinary work which was destroying traditional academic disciplines. Both sides would have to solve their own problems before the larger question of partnership could be tackled successfully.

Professor Denielou also looked at the lighter side of the present unsatisfactory situation. Academics, he said, felt they were regarded by industrialists as lazy, impractical revolutionaries working three hours a week for 25 weeks a year, while industrialists believed they were seen as philistine, overpaid mercenaries prepared to put workers out of a job in pursuit of a larger yacht.

His own university had asked a firm why Compigne had been chosen for a research contract, expecting to hear that the reason was the quality of staff or the excellence of research work, only to be told that it was because they had the cheapest toilets. This had indicated effective management.

Professor Brian Wilson, vice-chancellor of the University of Queensland, found isolation still more marked in Australia. But Dr Douglas Wright, president of the University of Waterloo, Canada, outlined a wide-ranging programme of cooperation at his own institution. The new industrial revolution would demand such interchanges, he said, whereas universities had taken almost no part in the first. The latest advances were based entirely on science and technology, to such an extent that knowledge had become the most important commodity in the world.

Dr Stephen Bragg, one of Britain's new academic brokers, was also optimistic about the potential for partnerships. Twenty years ago, he said, the idea of government-funded directorates steering university research into particular areas would have been considered a breach of academic freedom. But now the brokers were helping to bridge the huge natural resources of universities to the national interest by providing a focus for academic research in areas of national importance.

He found improvement still needed in several areas, but was optimistic about the future. He would have to accept, he said, that the results of his efforts would be taken up by industry. He said that the relationship between the university and industry was not taken up by industry. He said that the relationship between the university and industry was not taken up by industry.

Down to earth - and

The five-yearly Commonwealth University Congress, held at the University of Birmingham last week, is the greatest and most important of international university conventions, the nearest thing higher education has to an Olympic Games.

The congress, organized by the Association of Commonwealth Universities, brings together not only three of the nations with the most advanced system of higher education - Australia, Canada, and Britain - but also a nation with one of the largest systems, India, and a string of some of the world's smallest and least developed states, a few with total populations not much more than of an American mid-west multi-ethnicity.

This makes the CUC an almost unique sounding board for universities' global preoccupations. In the themes that dominate successive congresses at their quinquennial intervals, Edinburgh 10 years ago, Vancouver five, Birmingham last week, and Perth in 1988, it is possible to follow the intriguing shifts in these preoccupations.

In this context the thirteenth congress marked a kind of descent for the universities - into the abyss of total preoccupation with immediate social and economic demands, a few might argue; out of the clouds to place their feet firmly on the ground of the late twentieth-century world, a majority would probably reply.

Ten years ago the preoccupation was with universities as centres of cultural renewal five years ago with the then unfamiliar and disturbing phenomenon of the slowdown of student growth and the first serious budget cuts. Last week the concern was with the role of universities in technological innovation. The over-ambitious hopes of the 1960s had faded and the cuts, perhaps because they have become part of the fabric of everyday experience, were barely mentioned.

So the Birmingham congress was a business-like occasion. The social con-

Henry Chilver stressed that partnerships were not pseudo-commercial ventures to sell surplus ideas and products. They were essential to the future health of both universities and industry, and should not mean the undermining of academic values. There was no single formula for success but the best initiatives had come generally from the university side with the help of receptive industrialists.

Two ways of keeping in the know

CONTINUING EDUCATION

Two opposite views of how best to develop continuing education within universities emerged during the five discussion periods on this topic at the congress.

The first was encapsulated in the proud ambition of the electrical engineering department at the Massachusetts Institute of Technology to keep all its graduates up-to-date technically throughout their working lives, reported by Professor T. A. Brzustowski, vice-president of the University of Waterloo in Canada.

Professor Brzustowski argued that the turnover of science and technology could no longer claim to provide the learning with the basis for continued development. Often it was no longer clear what those fundamentals were.

So instead, universities would have to evolve new updating courses. Intensive, accessible, and very up-to-date, in order to maintain the technological competence of their graduates. He imagined that by the end of the century many graduates would use terms like "check-up" or "re-orientation" to describe their relationship with their university.

Continuing education could not be regarded as separate or peripheral activity, Professor Brzustowski argued. It had to be an integral part of the university's mission.

sequences of technology, rural development, university/industry partnership, technology transfer, continuing education, these were the major themes. They were reinforced by an elegant keynote address by Sir Adrian Cadbury, heir of one of the great Midlands industrial dynasties, also following his close involvement in the Leverhulme programme recently involved in higher education.

The five days of the congress would have brought little comfort to academic academics who believe that it is the duty of the universities to stand apart from society or to their radical rivals who argue that they must reform it. In almost all the discussions the practical or relevant university took absolute precedence over the liberal or critical university as a model for the present and future.

Perhaps the congress was suffused by the spirit of Birmingham itself, a city at the centre of a region where many of the key values of industrial society were forged two centuries ago. It was from here that Matthew Boulton, one of the pioneers of the steam engine, wrote to Boswell in the year of the American revolution: "I tell you, Sir, what all the world desires to have - power", as Sir Adrian reminded the congress.

Yet, inevitably because the congress was organized by an association of Commonwealth universities, the spirit of Birmingham itself, a city at the centre of a region where many of the key values of industrial society were forged two centuries ago. It was from here that Matthew Boulton, one of the pioneers of the steam engine, wrote to Boswell in the year of the American revolution: "I tell you, Sir, what all the world desires to have - power", as Sir Adrian reminded the congress.

Two of the five themes, rural development and technology transfer, were particularly relevant to the concerns of the Third World; two more, university/industry partnership and continuing education, perhaps more relevant to the more advanced nations.

He argued that conventional universities and polytechnics acting in their current styles could not be successful in meeting all the subsequent needs of modern graduates in a modern industrial society.

However, he believed that Open University-type courses acting in concert with conventional institutions could make up much of the shortfall. Professor Fred Jevons, vice-chancellor of Deakin University in Australia, argued that the educational disadvantages of distance education were already balanced by the advantages, and that new developments in communication technology would swing the balance in its favour.

He added: "A necessary condition for its success is, I believe, moral, organizational and indeed, economic separation from the institution's own activities".

Only in this way could continuing education be able to stand up to the existing vested interests in universities and be able to negotiate different incentive systems to persuade academics that they could become committed to continuing education without jeopardizing their careers and reputations.

Dr Griev also appealed to universities to be modest. "Too rarely are we the universities prepared to admit that anything is beyond us and often we persevere in trying to produce courses which we know could be developed with much greater ease and effectiveness by other bodies, sometimes by the consumer themselves," he explained.

Often universities should interpret requests for help with continuing education as requests to act as brokers bringing people together who might help each other rather than as an invitation to take a direct initiative.

A compromise between the Brzustowski and Griev positions was offered by Professor Brian Groombridge, director of the department of extramural studies at the University of London. He argued that continuing education had to be split up into different components.

Some parts of continuing education, such as traditional extra-mural courses, were best left to separate departments. Others, like specialist professional updating, had to be done by mainstream academic departments as part of their normal work. Others, like coping with mature students, required the skills of both continuing education and mainstream departments.

Sir Geoffrey Allen, director of research and development at Unilever and former chairman of the Science and Engineering Research Council, took a similarly intermediate position.

the thirteenth quinquennial Commonwealth Universities Congress held in Birmingham last week

business

of the Commonwealth. The fifth, the social consequences of technology, was a common global preoccupation. So maybe the spirit of Birmingham and the spirit of Brandt shared the honour of influencing the shape of the congress equally.

In any case the spirit of Birmingham has not necessarily been a stranger to international concern. For it was the high imperialism of the late nineteenth century, inspired by Joseph Chamberlain the effective founder of the University of Birmingham, who first tried to interpret empire as a new world order in which modern values were fully incorporated rather than as simple colonial piracy. The Commonwealth in a devious and distant sense may be in the same succession.

The coherence of last week's Commonwealth Universities Congress came as much from the informal, even symbolic, association of these traditions as from its formal agenda. Some sessions worked well; others hardly at all. Yet, thanks very largely to the superb organization of the host university, the congress as a whole worked very well. Not an Olympic Games perhaps because the competitive striving for excellence was absent, more a festival of Commonwealth universities in which past sentiment, present partnership, and future purpose are confusingly but richly mixed.

So perhaps a suitable valedictory might be Joseph Priestley's dedication to his former colleagues in the Lunar Society of Birmingham two centuries ago:

There are few things that I more regret in consequence of my removal from Birmingham than the loss of your society. It both encouraged and enlightened me as to what I did there of a philosophical kind ought in justice to be attributed as much to you as to me. From our cheerful meetings I have never absent myself voluntarily and from my pleasing recollection they will never be absent.

P.S.

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The shape of change to come

THE SOCIAL CONSEQUENCES OF TECHNOLOGICAL INNOVATION

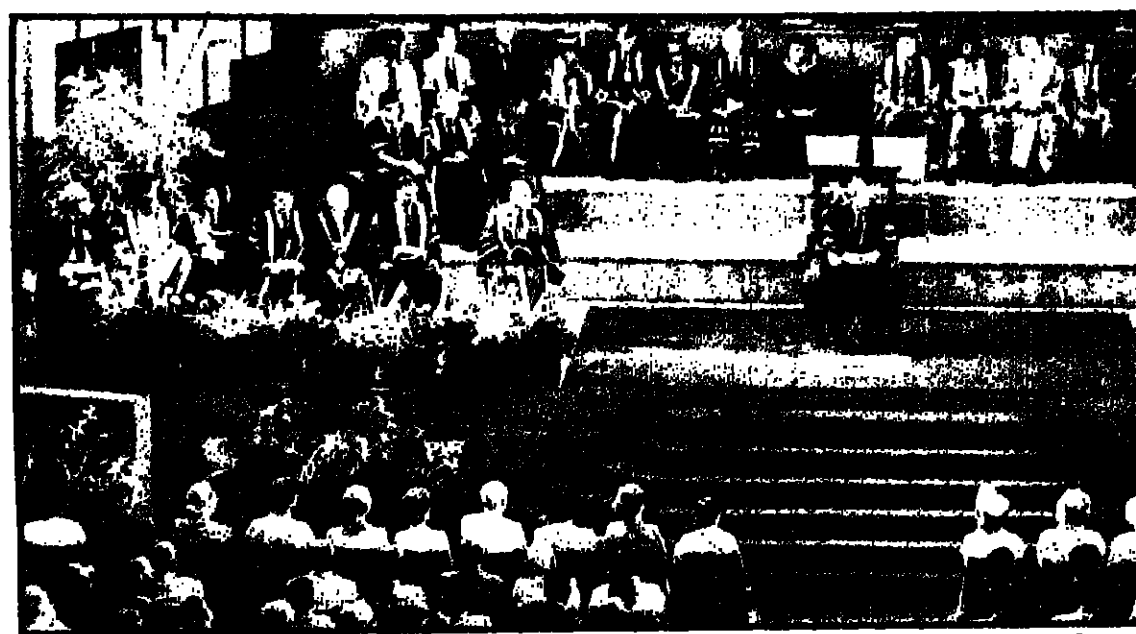
This session began with a paper by Sir Bruce Williams, director of Britain's Technical Change Centre, that might have been sub-titled, "Industrialization brings advantages and disadvantages. Discuss."

He ran through some of the changes brought about in Britain because of technical changes in the last 200 years: new methods of agriculture, increasing population, new markets, new industries, changes in types of employment, more wealth (for some), environmental control and pollution, a greater potential for war.

Technical change itself was not new, he said, but it was not until the eighteenth century that it became not episodic, but cumulative.

This point was taken up by Lord Flowers, rector of Imperial College, who wanted to know the reasons for this change in nature. Which was the horse and which the cart, innovation of education, he asked.

He threw out two questions for participants. It was Sir Bruce who



Opening ceremony... the Commonwealth Congress, higher education's "Olympic Games", gets under way

speculated, technological developments occurred in waves, was the next wave already with us as the embryo biotechnology, with information technology as its enabling machinery.

He questioned whether the description of how technologies arose in the West had any relevance to the developing world, with the presupposition of a positive cultural response. Or was it just a question of who happened to be the technological top dogs?

This question of whether other countries had to follow the example of the West kept coming back. In Bangladesh, one speaker said, people had the expectation of change and a better standard of life, but family life was breaking down, people did not know how to use training manuals, technicians were produced but then left. They had technology on tied terms.

Further, another speaker asked, what was Britain's example when a country had 70 per cent of its people in villages, working the fields.

Another strongly challenged the claim that in history technological change was progress. We were still only finding out the consequences of the Industrial Revolution. Were people really better off being tied to the factory rather than the home?

The same theme recurred - technology would only advance as and when we let it. According to H.I. Macdonald, president of York University, Canada, it would be a prime job of universities to encourage ethical and moral decisions about its control. So the stress must remain that universities were about developing inquiring minds. Individuals would decide whether they would allow themselves to be victims of changes in the work place.

Technology and education went side by side because the former meant retraining, rehabilitation and re-education. Technology therefore led to the need for more growth in education. He likened the removal of chains from the first books to today's information revolution.

Professor L. M. Birt, vice-chancellor of the University of New South Wales, highlighted one important difference in the dynamic of change, its pace. He said, by way of example, that the effectiveness of weapons had increased 200 million-fold between the emergence of human beings to the present - in fact, in only the last 200 years.

He was most pertinent in discussing the moral question which was fast overtaking universities in particular, and society in general: should we cease to do some of the things that men and women are capable of doing? Or did scientific inquiry have no barriers or frontiers?

But that question was altogether too diverging. Professor Birt listed the challenges he thought would shape the next complex of securing the maximum use of resources but preserving them for future generations.

● Censuring the universities linked their research work with scientific preparation for adequately trained scientists and technologists;

● the problem of what research, directed and initiated by whom, and questions of its "usefulness". This included the question of who pays and what the buyer contracts for, and how this changes a university's overall approach to the business market;

● making effective use of information technology;

● universities keeping abreast of social political and economic adjustments created by society;

● the ethical dimensions of scientific research.

This and other papers raised the question of whether present shapes of universities and their systems were right to cope with increasingly technological demands.

Dr C. R. Mitra, director of the Birla Institute of Technology and Science, made the point that universities were dynamic and as practices changed, new disciplines arose. But the scale of change was now so great that there needed to be fundamental changes.

Universities were necessarily slow in adaptation. To cope with new demands there must be a new structure for the curricula and a new mode of teaching. The university itself must become broader to enable it to welcome innovation of all kinds.

So if in the past the university was the repository of knowledge, in the future it would become the source of innovation.

N.C.

Which comes first: supply or demand?

THE DEVELOPMENT AND TRANSFER OF TECHNOLOGY

Though their backgrounds were different there was much to unite members of the Commonwealth discussing this topic.

How to persuade politicians to approve, and finance, the universities to ensure their research base was maintained; how the universities could convince the politicians that this was ultimately in the government's own interests; how to identify which research was useful to developing the country's economic base, or how to prove that the question was false; how the universities could resist demands for change internally and externally as their financial dependence on government changed or increased; whether the universities should resist those demands.

But to begin with there was a discussion on what science and technology were, and what role they had to play in fostering economic change and activity.

Professor Fred Jevons, vice-chancellor of Deakin University, showed that science was the popular instrument of change since the war, the "mother" of invention, until the sixties when disillusion set in.

Though there had been a massive expansion of science the old problems still remained and new ones, pollution, environmental damage, had appeared. So the driving force, it was felt, ought to be necessity, or the market.

Governments should be guided by these forces rather than fund research directly.

Academics seemed to support this view in their research into how innovation arose and why it was exploited, but current academic opinion is that 1970s

How to find a place in the country

THE CONTRIBUTION OF UNIVERSITIES TO INTEGRATED RURAL DEVELOPMENT

Delegates in the working group on this topic were not satisfied with a thorough investigation of the subject: they wanted action. Their final report included a plea to the executive of the Association of Commonwealth Universities to authorize the production of a compendium listing the organizations active in the field and the programmes undertaken in the universities.

Sir Robert Steel, former principal of University College, Swansea, and chairman of the group, said that the project would precipitate communication in a vital area. The hard pressed to take on the work but there was reason to believe one or two charitable trusts might help.

The topic, said Sir Robert, was the most important on the agenda for many Commonwealth countries and required an interdisciplinary approach. It was not simply a question of improving agricultural efforts; comprehensive development was required. The group was anxious to ensure that societies in the countryside received at least equal attention to those urban areas.

One problem identified by Sir Robert and dealt with in the several papers put to the group was the fact that most universities were urban institutions. "Students must be fired with a sense of vocation and mission so that more will see their work in the rural countryside," said Sir Robert.

Dr B. D. Sharma, vice-chancellor of the North Eastern Hill University in India, elaborated on these difficulties. "Even these institutions set up with specific orientation have not been able to break from the ethos of general universities in respect of the expectations of their graduates," he said.

"The agricultural graduates are keen to have a place in research organizations, extension agencies or other developmental institutions and participate in agricultural development as researchers or advisors rather than go to the village and engage in agriculture."

The rural universities also had difficulty in recruiting the best students because applicants saw the danger of not being qualified for jobs in the modern sector of the economy. All Indian universities were caught between conflicting pressures, from the students wanting the traditional liberal education on one side and the opposite demands of the economy on the other.

In other Commonwealth countries the demands of rural development were not in doubt but the best methods were still in dispute. Deryke Belshaw and Ian Thomas, of the University of East Anglia, entitled their paper *Safety in Theory or Danger in Practice* because they saw an implied contradiction between the two.

But, they argued, universities, especially in the developing countries, had a responsibility to direct a proportion of their research and other activities towards the needs of the rural poor, even if the work involved was not of the type traditionally associated with the role of the academic. University staff should be involved in research, training and executive work, in the full knowledge that new institutional arrangements might be needed.

The group was particularly concerned with the universities' potential for assisting rural communities through the development of the most appropriate technologies for their needs. In India, for example, important innovations had been made in bullock carts and another paper described the benefits of university assistance for Sri Lankan fishermen.

But even this came back to an inter-disciplinary approach because of the need for communication with the villagers concerned. As one paper put it, the primary role of the university in rural development should be as a think tank and planning body.

N.C.

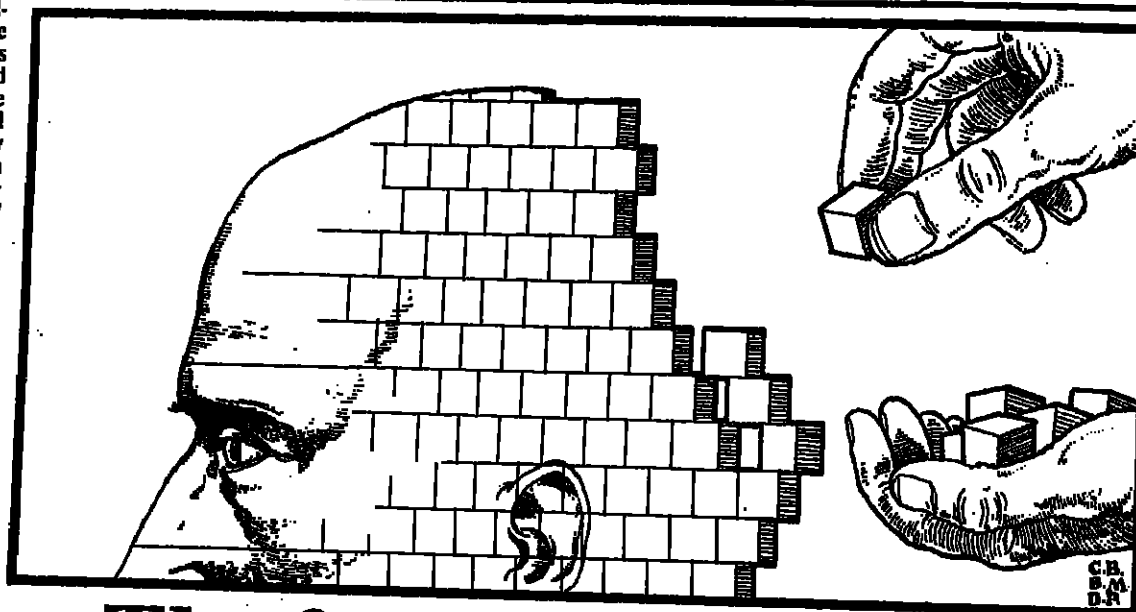
J.O.L.

Even 20 years ago, innumerate school-children who opted for biology were being urged not to give up physics because "it will help you understand the instruments we use". Today, the links between biology and the physical sciences are even stronger, particularly in the field of protein chemistry, a cross-disciplinary subject usually studied as part of a degree in biochemistry or biophysics.

Although elementary topics in protein chemistry—structure and function of enzymes, antibodies, haemoglobin etc.—are now discussed even in O level biology, in-depth study requires considerable insight from both biological and physical sciences. The methodology of protein chemistry derives from physics and chemistry, while the information it produces now underpins large areas of biology, physiology, medicine, toxicology, biotechnology, pharmacology, botany, zoology etc.

At the molecular level, proteins control the chemical reactions responsible for growth and maintenance of the cell—the anatomical building block of all living organisms. Together with the polysaccharides and nucleic acids, they make up the macromolecules of which cells are composed. Proteins are synthesized by stepwise addition of small-molecule building blocks, the amino acids. Different proteins may have molecular weights from one to several hundred thousand, and they occur in the cell not as elongated chains but in compact folded form.

The key to their biological role lies partly in the nature and order of amino acids in the chain and partly in the three-dimensional shape of the folded, biologically active molecule. This shape approximates to a sphere with precisely defined surface geometry—rather like the wrinkled surface of a walnut, with every day and protuberance defined. The control role of proteins in biology derives from the enormous selectivity of their surface



The foundations of life

Protein chemistry lies at the heart of our understanding of the biological sciences. Anna Furth describes this important cross-disciplinary subject and its application in industry, medicine and basic biology

manufacture of drugs, foodstuffs and other products.

The use of enzymes in cortisone manufacture has enormously simplified the production procedure, reducing costs so that the drug's market value has fallen considerably. Early industrial processes used entire cells and their battery of enzymes, for example in the conversion of sugar to alcohol by brewer's yeast. However, the trend nowadays is to extract individual enzymes from the cell, immobilize them on inert supports and use them to catalyse particular steps in production.

The attraction of enzymes lies partly in their high specificity and partly in their modest working requirements. Expensive and corrosive items such as high temperatures, pressures and acidity can—and must be avoided. Expertise in protein chemistry is needed to develop ways of extracting enzymes from their cellular environment without destroying the surface geometry on which their properties depend.

Enzymes are no longer the only proteins to be exploited commercially for their powers of selectivity. Recently there has been an explosion of interest in antibodies, the serum proteins synthesized by the body's defence system, on invasion by foreign material. Bacteria, viruses and—under experimental conditions—even small molecules, can stimulate production of specific antibody proteins.

The biosynthesis of specific antibody proteins is a remarkable system, allowing the body to distinguish foreign molecules from similar molecules within its own cells. Autoimmune diseases like arthritis are thought to result from breakdown in this fail-safe self-recognition mechanism. Successful vaccination against diseases such as polio



interactions. Only molecules whose surfaces are complementary to selective "active site" areas on the wrinkled protein surface will interact with it. This molecular recognition system underlies the biological activity of all proteins: be they enzymes, antibodies, hormone receptors or structural proteins.

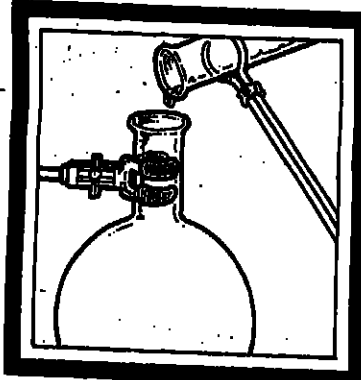
Much of protein chemistry is concerned with structure-function studies, trying to relate the biological activity of a protein to its surface geometry and to the subtle changes this may undergo during cellular activity. Basic research, therefore, comes under the general long-term aim of better understanding in molecular terms of how living organisms operate in health and disease. However, biotechnology is now adding further incentive to applied research in protein chemistry.

Biotechnologists are particularly interested in enzymes, the catalytic proteins that control chemical reactions within the cell. These reactions enable living organisms to harness and store energy from the sun and use it to convert simple carbon and nitrogen compounds to complex intermediates, channelling them through a web of interlocking chemical reactions to numerous different end products. These multi-step conversions are made possible only by the selectivity of the enzyme proteins which catalyse each step in the reaction sequence.

Protein chemists aim eventually to relate the structure of enzymes to their high specificity and catalytic efficiency, hoping thereby to understand their central role in cell chemistry. The characteristic symptoms of several "metabolic" diseases for instance can now be traced to malfunction of single key enzymes. Other incentives are commercial: industrial chemists have long used enzymes to accelerate chemically demanding steps in the

years, has had a major impact on all branches of biology. Not least has been the emergence of the antibody protein as a major new biochemical tool.

Modern medicine requires high specificity methods for detecting small quantities of drugs, hormones, cancer-specific proteins and other compounds in serum and urine. Conventional chemical methods are too insensitive,



and hospital laboratories are increasingly making use of immunoassays, where the key reagent is an antibody protein, synthesized under conditions which give it a surface binding site exactly complementary to the compound to be measured.

For many immunoassays, the antibody must then be "labelled" for easy recognition, usually by incorporating a radioactive or fluorescent atom into its structure. Therefore to develop a successful immunoassay requires insight into the cellular mechanisms by which antibodies are produced and also an ability to chemically manipulate the antibody protein without destroying its surface geometry. Through immunochemistry, therefore, protein chemistry is making a great impact on diagnosis and monitoring in medical and related sciences, wherever small quantities of specific compounds must be assayed in the presence of contaminants.

Much of protein chemistry is still directed at studies on proteins of no obvious commercial or medical application. These include the receptor proteins which interact specifically with messenger molecules from other parts of the organism, or even from outside it, as in the sense of smell. The majority of receptor proteins are embedded in the cell's fatty membranes surrounding the cell and until recently were difficult to isolate for study in intact form.

With new techniques we are now beginning to understand how receptor proteins function, how they relay messages into the cell, and how this information might be used by man to answer such questions as: Does diabetes arise from lack of natural insulin or from poor receptor action? Can heart or lung hormones be used to decay diseased vessels to their death? (Injecting may

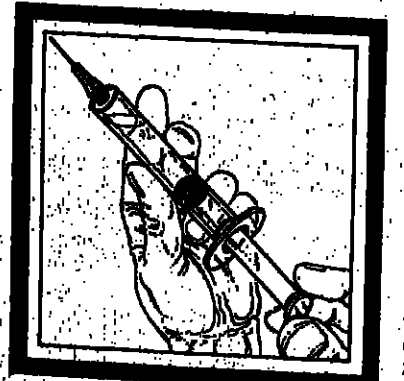
mile upwind, because of the impact of specific windborne sex hormones on the receptor proteins in their antennae).

Proteins also have specific interaction sites for nucleic acids, the genetic material of the cell responsible for growth and heredity. A better understanding of the mechanisms of protein-nucleic acid interaction could tell us what controls growth in normal and malignant cells. Finally, proteins bind to one another, aggregating into enormous molecular assemblies that eventually become recognizable as characteristic cell structures, visible under the microscope—chloroplasts, mitochondria, cell nuclei etc.

Until recently the techniques available to protein chemists enabled work on only comparatively simple small proteins, such as the water-soluble enzymes, and the oxygen-carrying pigment haemoglobin. Nowadays we are beginning to understand the mechanisms by which proteins interact with one another, and thus control the self-assembly of living cells from their constituent macromolecules.

Ever since it emerged as a specialist subject, protein chemistry has been particularly dependent on techniques. Indeed, major advances have followed almost automatically from new methodology, and Nobel prizes in this field—of which there are many—tend to be awarded as much for innovative technology as for its applications.

Specialized techniques are needed not only because of the structural complexities of proteins, but because of their paucity and fragility. To purify even a few milligrams of some of the cells' more interesting proteins may require careful processing of several



hundred grams of tissue, carefully avoiding the high temperatures, acidity etc., often used in standard organic chemistry. But even greater ingenuity is needed for structural studies on the purified protein, which may be some hundred thousand times larger than a simple organic chemical.

Protein structure is analysed at two levels. The first concerns the grouping of constituent atoms into chemical functional groups and the sequence of amino-acid building blocks (each with

some 100 odd atoms) along the protein chain. This sequencing is generally a collaborative effort, once equivalent about one "person-year" of work is protein but now often largely automated.

The first complete sequence, that of 51 amino-acid-long insulin, was determined by the Nobel prize in 1958. Since then many hundreds of proteins have been sequenced, though nowadays the trend is to sequence the gene segment coding for a protein, rather than the protein itself—an approach undreamt of even 10 years ago.

Determining the chemical structure of a protein is costly on chemical and technician time, but nowhere near as expensive as techniques for studying the chain folding pattern which produces the surface geometry responsible for biological activities. Even the largest proteins appear as indistinct blobs under light or electron microscope and their structures would have remained obscure but for major technical advances, made available by physical scientists interested in biological problems. For example, X-ray, neutron and electron diffraction by specially prepared biological specimens have yielded detailed information on the interlocking of protein molecules to form subcellular structures and on the atomic configuration of individual protein molecules.

Pure biologists are unable to cope with the underlying physical principles and mathematical manipulation, while pure physicists have not been trained to prepare biological material. The project requires collaboration between biological chemists able to produce suitable forms of the protein and physicists bold enough to take on the enormous complexities of biological material. Furthermore, even the smallest protein generates a massive quantity of diffraction data and although early studies, (such as those on myoglobin and lysozyme in the early 1960s) were published before the age of



powerful computers, modern structure determination relies heavily on computer backup.

The expense for these studies for a suitable electron microscope, for NMR facilities and for a single neutron diffraction experiment on the cytochrome at Harwell or Geneva may be enormous. The "centre of excellence" principle established in the Rothschilde report is therefore likely to continue with the Medical Research Council unit at Hills Road, Cambridge (home of Nobel prize winners Perutz, Klug, Sanger, etc) leading structural work in this country.

Expensive chemicals and standard equipment such as preparative centrifuges and spectrophotometers are needed for even the least ambitious projects, but it is essential that research in this field should continue. More work is needed to exploit the knowledge we already have, as in the industrial applications of enzymes and—the ever-successful Japanese—the use of monoclonal antibodies.

Although the basic principles of protein structure are now largely understood, thanks to intensive efforts over the past 20 odd years, basic research is still needed to move up the scale from individual proteins to large protein-based aggregates; these might include the light harvesting centre in plant chloroplasts, protein-nucleic acid aggregates in chromosomes, and other subcellular structures. Despite its relevance on chemistry and physics, protein chemistry lies at the heart of our understanding of the molecular basis of biological sciences, with applications in industry, medicine and throughout basic biology.

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Bruce Collins looks at disillusionment which has dogged American blacks since emancipation

It would be ironic if the bicentennial of America's federal constitution were to be celebrated in 1987 with a black as vice president. Unlikely as well, most observers would say. Yet Harold Washington's mayoral success in traditionally unenlightened Chicago has lent weight to the "it's our turn" rhetoric of black American politicians. There is serious discussion of the Reverend Jesse Jackson's running for the Democratic presidential nomination; Martin Luther King's disciple will not win that slot, but he might just become part of a "dream ticket".

That blacks are pressing for a candidate of their own reflects disillusionment with the effects, or non-effects of the policies of the 1960s. The last twenty years' undoubted and often dramatic advances for middle-class blacks have still not disbanded the ghettoes or heavily depressed the correlation between blackness and deprivation. Subsequent disillusionment even with the Democrats has produced the claim of some influential black spokesmen that only a candidate from their midst can galvanize the ghetto people to register and to vote. This pattern of high hopes unfulfilled and dreams of racial improvement unrealized has twice occurred on a major scale in American history. The Reconstruction experiment of the 1860s and 1870s achieved much. But it was counter-balanced for the vast majority of freed blacks by the economic and political blight settling in from the 1880s and especially the 1890s; black disfranchisement, lynch law and black peonage became a quotidian norm. Before that, blacks experienced another false dawn in the slipstream of the Revolution. For in the summer of 1783, as American states were about to secure their formal independence, serious Southern consideration was given to emancipation.

The coincidence of the American Revolution and slave emancipation has been much examined by historians. It was of great initial importance. War itself interrupted and curtailed slave trading and made Northern states' emancipation laws, typically gradual in their impact, easier to pass. The contradiction between their own talk of equality and liberty in the 1770s and the prevalence of slavery struck Americans in the northern states, and even in the plantation South, increasingly hard. As natural rights ideas were enlisted to American service, so they took wider effect.

And Enlightenment precepts, imported pre-packaged from Europe, worked against continued enslavement. Such ideas operated first in the northern states, where slaves were few in number and concentrated in cities. Vermont, not much affected by slavery, led the way in 1777 with a constitution prohibiting slavery; in the 1850s Vermont was to be the state most opposed to slavery extension. Pennsylvania in 1780 enacted gradual emancipation, and in 1783 Massachusetts, and England did earlier, banned slavery through judicial decision.

Virginia though was the principal slave state, in population, in wealth, in prestige. Its leaders were of national stature. Washington admittedly was an absentee Virginian during the hostilities; Virginia's wartime governor, Thomas Jefferson, did not meet the general between 1776 and 1783. Yet Jefferson himself, though staying put in his home state, was widely enough known and well enough regarded to be nominated as one of the five American peace commissioners in 1781. James Madison, serving in the Continental Congress, was in close correspondence with Jefferson in 1782/83, forging the partnership that was to carry both to the presidency. Both were men of formidable intellect and Madison was learning his trade as a parliamentarian.

More pertinently here, neither man felt committed to slavery. Of course, slave ownership was part of their life style. Yet both took a long-term and reasonably detached view; just as Jefferson was sufficiently detached to avoid personal financial involvements in western land companies that might have clashed with his political responsibilities over western lands.

The clearest manifestation of Jefferson's view came in June 1783 when he drafted a proposed new constitution for Virginia. Jefferson repudiated property and humanitarian interests. No slaves then living in Virginia would be freed by constitutional require-



Thomas Jefferson (left), Benjamin Franklin and John Hancock leave Independence Hall in Philadelphia after signing the US Declaration of Independence

The long, hard road to freedom



Harold Washington thanks supporters after winning the

mayoral primary. With Washington are his fiancée, Mary Smith and the Reverend Jesse Jackson, who may run for the Democratic presidential nomination.

ment. But all children born to slaves after 1800 were to be free at birth. No thought appears to have been given to the effect of infant emancipation upon slave parent-free child relationships; or to many slaveowners' probable indifference to the feeding, clothing and care of their slaves' children when such offspring no longer represented a capital asset. Yet the advantages of distant emancipation were obvious. State financial outlays were not required. Owners would enjoy a full 17 years' slave labour and slave breeding before the latter source of income was cut off. Some slaves living in 1783 might still have been at their chores in 1840. Property rights were scarcely assailed. Even allowing for this necessary pragmatism, however, Jefferson's position was an extraordinary one for so prominent a politician in so important a slave state to adopt. Truly, the future for Virginia's blacks—or rather their children or grandchildren—seemed propitious in 1783.

Willingness to propose emancipation owed as much to practical as philosophical considerations. War unsettled blacks. Virginia's last royal governor, Lord Dunmore (who has left us a more enduring monument to his imagination in the shape of a giant stone pinnace near Alrith, Stirling), was the first to embrace emancipation; he promised freedom to slaves who deserted their rebel owners. In the early 1780s the upheaval that accompanied British military defeat, as Loyalists left for the colonies that became Canada or for British Caribbean islands, helped create an atmosphere almost of post-war reconstruction. Some slaves accompanied Loyalist owners in their exodus. Some formed part of the departing British army's booty; when the South's most illustrious pre-1860 novelist, William Gilmore Simms, wrote a popular history of South Carolina (1840), he was especially eloquent against this British

seizure of American slaves. In addition, some blacks fought in the American cause; and slaves among them gained their freedom. If fighting blacks achieved more in the Civil War and the Second World War (a desegregated army followed the latter), they still won something from the Revolution. The French presence after 1778 and particularly in 1781, may have encouraged a man so sensitive to international opinion and so sympathetic to French ideas as Jefferson to look upon his home state with an outsider's eye. His most explicit arguments against slavery were, after all, written in 1781 in answer to French inquiries and later expanded for European non-American publication in 1840. Wartime material losses (Jefferson claimed twelve slaves lost through a British raid in 1781 and its consequences) and wartime disruption of production dependent on slave labour may have allowed Jefferson a more detached view of domestic affairs. It is possible also that Jefferson and Madison wanted to keep Virginia in step with emancipation movements farther north; to avoid an excessive sectional divergence on important issues.

Both were intensely worried at the prospect of the American states simply drifting apart. In February, 1783 Jefferson confided: "I find also the pride of independence [is] taking deep and dangerous hold on the hearts of individual states. I know no danger so dreadful and so probable as that of internal contests. And I know no remedy so likely to prevent it as the strengthening the band which connects us." Finally, and this inspired his proposal for a new constitution in 1783, Jefferson appreciated that the moment of flux and post-war reconstruction would not last long.

A major change had been enacted by Virginia's legislature, the previous year. Since 1721, manumission of slaves had been conditional upon the

consent of the governor and council, consent grudgingly given. In 1782, however, this restriction of slaveowners' property rights was lifted; manumission could be granted at the owner's will. The response, while an impressive enough testimony to some slaveowners' antislavery feelings, was not of revolutionary proportions. Between 1782 and 1790 the state's free black population rose from about 3,000 to about 13,000, whereas black Virginians numbered a quarter of a million in all. Going from private manumission to general, if glacial, emancipation would require a long stride forward. Yet commitment to manumission waned after the promising, though modest, start of the 1780s. In 1793, Virginia's legislature forbade blacks to enter the state. Efforts to end private manumission only just failed in 1805 and 1806.

This later reaction against free blacks was fuelled by anxieties about free blacks' subservience which had long existed. Such anxieties were made explicit by a black rebellion in Saint Domingue (1792) and by Gabriel Prosser's planned slave rebellion in Richmond (1800). These events, as the Indian Mutiny of 1857 was to do in Britain, were taken as justifying virulent white racism and strengthened the idea that a free black population would not peacefully coexist with whites. Some historians have contended that much of the humanitarian and religious impetus behind anti-slavery was a reaction against the horrors of the slave trade; the end of transatlantic slave trading set many white consciences at rest. Other historians have stressed that economic conditions in the 1780, with a surplus of labour for tobacco's needs, encouraged humane responses, whereas the extension inland of cotton growing after 1793, with the invention of the cotton gin in that year, set up new, and apparently insatiable, demands for slaves. Yet these explanations for a reaction against black freedom assume that the circumstances of 1782/83 favoured the advance of black liberty, an assumption at best but half warranted.

As Madison was at the Continental Congress, Jefferson maintained a lengthy correspondence with him in 1782/83. In June 1783 he sent his draft for a new state constitution to his colleague. Madison's thoughtful and long reply made no reference to the proposed emancipation. So, too, Jefferson's papers for 1782 and 1783 contain nothing urging the anti-slavery cause. Washington in February commented that the prospect of peace "absorbs, or seems to do so, every other consideration among us." Madison fretted repeatedly over the Confederation's finances, debt funding, and inter-state relations; he also fought in Congress to defend Virginia's claims to lands beyond the Appalachians. Even when immediate political matters were put aside, the subject of slavery merited little attention. In early 1782, Jefferson was asked to become a councillor of the American Philosophical Society, at Philadelphia. On asking further about the place of honour, he was informed of the wonders that were open to "the philosophic view". On political and social questions: "Our governments are yet unformed and capable of great improvements in police, finance and commerce. The history, manners and customs of the Aborigines are but little known." None of this suggested that the Revolutionary intelligentsia were to focus their enlightened attentions upon the prospects for emancipation. Nor did Jefferson itch to play his part in state legislative affairs; he declined to take his seat in the Virginia house in May 1782. And when he commented in the following year on the legislature's work of 1782 he merely complained of its low calibre and lack of interest in general constitutional reform.

Just as the intellectual tide did not seem to be running very hard in an antislavery direction, so the actual number of private manumissions did not suggest that the economic trade winds were blowing against slaveholders. Statute confirmations of the act of 1782 and strong support for property rights in slaves—conveyed to the legislature in 1784 and 1785 in a flood of petitions—showed that the humanitarian case against slavery was far from being in the ascendant. Moreover, while the closing years of the war offered opportunities for change, the very fluidity of affairs—Virginia had been invaded in 1781, slaves had been stolen, Loyalists had departed, the future of the Confederation was uncertain—raised problems calling for speedy solution more loudly than long-term thinking about slavery.

For these reasons, emancipation remained but a faint promise. Again as Davis has said: "Jefferson had only a theoretical interest in promoting the cause of abolition." While he believed sincerely that slavery should end, he was too intellectual, too gentlemanly, too detached to translate the conviction—one among many others—into an active cause. He would not have agreed with the impassioned antislavery politician, Charles Sumner, in 1850, that the Senate was "a mighty pulpit from which the truth can be preached." Jefferson was too much a rationalist to preach, and too aware of racist prejudice in the South to see swift emancipation as a possible alternative to servitude. Given all that, and the rush of other, more pressing events in 1783, the emancipation proposal was simply slipped into a draft constitution that was never formally considered; it initiated no contemporary debate and its originator went off to the Continental Congress and, in 1784, to France. As Jefferson himself had been told earlier by a leading revolutionary: "I am sensible that plans of public utility however promising and pleasing they may be, are the first appearance, soon grow languid unless it be the particular business of some men or set of men to urge them forward."

And so the events of 1782/83 and their aftermath have a certain resonance today. For as the plans of the 1960s for improving the ordinary blacks' lot have lost momentum, so black leaders increasingly feel that the best men to urge things forward might indeed be blacks themselves. It is about time that they were given their chance to try.

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BOOKS

Where Aberdeen went wrong

by John Prest

Lord Aberdeen: a political biography
by Muriel E. Chamberlain
Longman, £25.00
ISBN 0 582 50462 7

History. Dr Chamberlain argues, has not been kind to Aberdeen. His government collapsed in the middle of the Crimean War, and the general opinion that he had been either unpatriotic, or incompetent, or both, was as strong in 1860, when he died, as it had been when he was compelled by a "professional smear campaign" to yield his place to Palmerston five years earlier. From a very early age Aberdeen kept all his correspondence. But Gladstone intervened to prevent the publication of his papers, and for many years there was no "official" biography. His enemies thus had a head start, and Ellenborough's *Political Diary* and Lane-Poole's *Life of Stratford Canning* appeared before Aberdeen's youngest son, Sir Arthur Gordon, published the first life in 1932. More than a century after Aberdeen's death, Professor Conacher's *The Aberdeen Coalition* (1968) was the first study to strike a more sympathetic note. Now comes Dr Chamberlain, who adopts an explicitly revisionist stance and advances the hypothesis that, had Aberdeen and Palmerston both retired at the age of sixty-five (in 1849), "their posthumous reputations would have been very different".

The most successful parts of Dr Chamberlain's book are those in which she portrays Aberdeen's merits as a family man, a scholar, and a Scottish landowner. Aberdeen's father died when he was seven, and his mother when he was eleven. His first marriage lasted five years before his beloved Catherine died in 1812. Their only boy died on the day he was born, and their three girls succumbed, one after another, to tuberculosis before they came of age. Aberdeen married again, and this time there were four sons and one daughter. But his second wife died in 1833, and their daughter a year later. For the Aberdeen who helped to nurse his sick children with his own hands, and sought comfort in his successive bereavements from Howley, the Archbishop of Canterbury, there can be nothing but sympathy.

Second comes Aberdeen the scholar. Following the conclusion of the Peace of Amiens in 1802, Aberdeen accompanied George Whittington on a tour of French cathedrals undertaken in order to dispel the belief that Gothic architecture originated in Britain. Aberdeen's journeys carried him right on through Italy to Sicily, Malta, Athens, Constantinople, Asia Minor, and the Moslems. He picked out everything from the spot where Marcellus must have suffered Syracuse during the Punic Wars, to the theatre in Ephesus where St Paul provoked a riot among the silversmiths. While searching for the site of Troy, whose location depended upon the identification of the two rivers mentioned by Homer, the Scamander and the Simois, he carried a thermometer, and took the temperature of what were supposed to be the hot and cold sources of the Scamander. Upon returning to Britain, Aberdeen contributed to a review of Gell's *Topography of Troy*. His architectural notes enabled him to demolish Dureau's attempt to prove that the arch had been in use since the second millennium BC. In 1816 he pronounced to a select committee of the House of Commons upon both the antiquity and the aesthetic merit of the Elgin marbles. In 1822 he published *An Inquiry into the Principles of Beauty in Grecian Architecture*. There can be no question that he was a worthy president of the Society of Antiquaries, and that he deserved his place as a trustee of the British Museum.

Third comes Aberdeen the Scottish landowner. He inherited over 30,000 acres, and nearly 5,000 dependent tenants. He adopted model leases, and planted fourteen million trees, and promoted an Act of 1824 which widened the power of helms' entail. He contested three elections for a place as a representative peer, and always kept a watching brief upon the affairs of



A Punch cartoon from February 1854: "What it has come to, Aberdeen!"

Scotland at Westminster. He objected to Lord Liverpool's plan to abolish small denomination banknotes (the Scottish system of banking being, as he said, quite different from the English), and in 1826 he was appointed to the Royal Commission of Inquiry into the Scottish Universities. In 1835 he jibbed at any possible extension of the principles embodied in the English Municipal Corporation Reform Act to Scotland, and in the mid-1840s he attempted to resist the more extreme claims of the non-intrusionists who were disrupting the Scottish church.

Aberdeen should, perhaps, have been content with the career of a scholar and a Scottish landowner. But he never really had the chance. Under

common law he had the right, at the age of 14, to choose his own guardians, and the persons he selected were Pitt and Dundas. Their example inevitably suggested to him that he was cut out for a career in high politics, and in 1813 he accepted an embassy to Vienna. In due course he became Foreign Secretary between 1828 and 1830, and Colonial Secretary in 1835, before returning to the Foreign Office in Peel's ministry of 1841-46.

There is much to be said in favour of Aberdeen's handling of foreign affairs. He sought to calm rather than inflame the ways of nations, he was determined to establish an agreed frontier between Canada and the United States of America, and he refused to

take any part in the invasion panic of 1845. Presumably he considered these things worth the penalties he had to pay for them, which were the suspicion, even of close colleagues, that he entered too readily into the feelings of the people he was negotiating with, and charges published in the newspapers that he sold his country short by asking too little and giving too much.

It is in this part of the story that Dr Chamberlain seems to lose sight of her revisionist mission. Overborne by the many criticisms, she suggests that Aberdeen mistook his métier when he became convinced that his destiny lay in what she goes as "the adversarial field" of foreign affairs. She concludes that he would have been better equipped

to conduct politics at home, when she claims, there was always a large measure of consensus.

This is a surprising judgment to make. Dr Chamberlain cites O'Connell's assertion that Aberdeen was a "man at home", and it is true that Aberdeen stood staunchly behind Lord John Russell's Reform Bill of 1832. But a general his role as a liberal is not convincing. He did not understand the need for parliamentary reform in the 1820s, and when the Whigs were able to bring in a Reform Bill in 1831-32, he shared the full in the Tory element. It must lead to the abolition of the monarchy and the House of Lords.

In 1917 Aberdeen was eager to look that there was an international conspiracy of the right to suppress the liberties of Europe, but in 1832 he was easily drawn into expressing his best in an international and revolutionary conspiracy of the left to topple the thrones of Europe. For over ten years, from 1813, he agreed in opinion with Metternich. The consequence was that he misinterpreted Britain's part in harbouring political refugees as sedition promoting "the rapid progress of the democratic spirit throughout Europe" by means of terrorism.

There is no ground in all this for supposing Aberdeen could have won more applause upon the domestic than the foreign scene. Aberdeen was a great, because an independent-minded Foreign Secretary. Unlike Palmerston, he was sometimes willing to sacrifice British interests to the cause of peace, and always willing (except, perhaps, to Greece) to frustrate the aspirations of liberals and nationalists abroad. The abuse which this brought down upon him, from both right and left can be counted in his credit. The tragedy of his having mistaken his métier lies in the fact that the vanity which he had to accept the Vienna embassy in 1813 in order to secure a United Kingdom peerage, also prevented him resigning in September 1833, nine months after the country was being drawn into a war which he knew to be unnecessary. Dr Chamberlain did not stumble at this point along the road, she might indeed have been able to retire both Aberdeen and Palmerston at sixty-five, and award the palm to Aberdeen. For nately, she has provided enough evidence for the appreciative reader to do this for her.

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Jewish business

Economic History of the Jews in England
by Harold Pollins
Associated University Presses, £20.00
ISBN 0 8386 3033 2

Antisemites seem to know everything there is to know about the economic activities of the Jews. Hence P. Hugh O'Donnell, one of the most vicious Jew-haters in Britain before the First World War, could draw attention to "The Jew Kings... a Jew King of petrol... a Jew King of silver... a Jew King of soap... and a Jew King of salt and soda and nickel". In fact, until now we have the economic activities of Anglo-Jews. Moreover, if one develops a wider perspective, it soon becomes apparent that we have generally neglected the economic history of all immigrant and minority groups in Britain. Harold Pollins has set out to remedy this state of affairs, at least as far as the Jewish community is concerned.

His major concentration, after a brief prelude on the medieval background, is with Anglo-Jews from the Renaissance to 1650 to the 1930s. He traces, through the history of these years, the Jewish community from its beginnings in the "ghetto" to its dispersal into the mainstream of British society. He also traces the history of the Jewish community in England from its beginnings in the 17th century to its dispersal into the mainstream of British society.

trade, such as clothing, footwear and food, for example, and particular areas of commercial activity (trading in diamonds and precious metals), figure prominently in the course of discussion as important elements in the economic history of the Jews in England. An involvement in finance and a concentration in a small number of professions such as medicine, law, and in more recent times accountancy, are also emphasized. In the course of unearthing this, a number of important points are made. Pollins shows, for example, that contrary to much popular belief, there has always been a Jewish presence in Britain, and that the Jewish community, although represented in the press and the media generally, has been less influential in these areas in Britain than in a number of other countries. Moreover, although in his synopsis of his book, the *Jewish Chronicle* dwelt on success "They made it in Britain", Pollins emphasizes that the Midas touch was not always present with Jews and that, in some cases, it could suddenly disappear.

The analysis of these developments, affecting a community that grew from 180 in 1657 to 400,000 by the 1930s, shows a commendable attention to detail. How many people know that Sam Goldwyn once worked as a blacksmith's apprentice in Mandelstam? How many of the books on recent Jewish immigration into Britain refer to the arrival of the "Bessarabian" refugees, who left India after that country gained its independence in 1947? Pollins also

engages for the most part in a careful evaluation of his material and, in the end, puts Antonia Fraser firmly in her place. Moreover, at a time when there is a tendency in some quarters for writing on immigrant groups to be as dense as a Bavarian thickset, he writes simply, lucidly and well.

However, there are some less positive features. The economic activity of all minority groups has been significantly influenced by the attitudes and behaviour of the majority. Many minorities have been allowed a licensed preserve; black sportsmen and gypsy entertainers do not pose a problem. In the case of the Jews, antisemitism has been a continuous feature of western society from which British has not been exempt. Yet the consequences of this interaction on Jewish economic structure, although raised, is not specifically developed. Pollins has a facility for summarizing the findings of other researchers; he dwages at times, however, that he had engaged in more systematic investigation on his own account. Furthermore, although he emphasizes that his intention is not "to produce a directory of Jewish business", at times his study reads exactly like that. One can almost hear the "name spotting".

Apart from its scope and approach, one can also raise questions on specific detail. In discussing the great immigration of Ashkenazi Jews from the Russian Empire that took place between 1881 and 1914, for example, Pollins makes the point that very few married Jewish women immigrants went out to work. Although he does not say so, this would seem to be a very significant

reversal of Jewish economic life that had been carried on in Russia, where women were often the breadwinners. A recognition of this important fact and the possible reasons for the temporary absence of the new pattern are noticeably absent.

There are also a number of points where Pollins restrains his left hand. Edgar Speyer, we are told, left Britain in 1922 "following attacks on him during the war because of his German connections". In fact, Speyer was alleged to have conducted exchange arbitrage in 1915 knowing that it would involve traffic with Germany. Pollins also avoids any reference to the involvement of Jews in the secondary banking crisis of the early 1970s.

Finally, and understandably in view of its wide scope, the book has its own small catalogue of errors. One only might be mentioned by way of example. It is simply untrue to say of Sheffield that by the 1930s "the Jewish cutlery firms were absorbing only Viner's continuing independence". It can be reported with confidence that the steel city that Harris, Mott and the octogenarian head is busy planning for the future, and that the university has just benefited from his financial generosity. Viner's, incidentally, has now gone into the hands of the receiver.

Colin Holmes

Colin Holmes is reader in economic and social history at the University of York.

BOOKS

Jobs for women

Women at Work: the British experience
by George Joseph
Philip Allan, £14.00 and £6.95
ISBN 0 86003 054 7 and 1 489
Tackling Discrimination at the Workplace: an analysis of sex discrimination in Britain
by Brian Chiplin and Peter J. Sloane
Cambridge University Press, £15.00 and £5.50
ISBN 0 521 24565 and 28788 X

Despite a marked growth in the participation of women in the labour force during the past twenty years, the characteristics of the female workforce remains substantially different from its male counterpart. Several years after the passing of the Sex Discrimination and Equal Pay Acts the problem of sex discrimination continues, though as both these books show, the different situations of working men and women is explicable only by reference also to the division of responsibilities in the home.

George Joseph offers a broad sweep of the development of the female labour force over the last century. He identifies the motivations and conditions that have favoured an increase in female employment, and the factors that have influenced women's overall position in the workforce. Amid a detailed examination of the trends in participation rates, the rapid increase in female employment in the 1960s stands out, particularly in relation to the employment of married women, many of whom were attracted by increased opportunities for part-time working. However, despite holding almost four jobs in every ten by 1971, this growth in the range of occupations for women has succeeded into higher level jobs.

In seeking explanations for these persistent trends both books emphasize the harmful effects (in terms of career progression) of the discontinuous nature of most female employment. Leaving work to bear and raise children results in a reduction in job experience, and discourages many employers from offering lengthy periods of training to women; both these factors are identified as closely linked to occupational advancement.

On the question of earnings differences, Brian Chiplin and Peter Sloane identify a common gap of about 30-40 per cent existing in different countries between the average earnings of the male and female workforces. Much of their book is devoted to a discussion of the problems of defining and measuring discrimination at the workplace. One of their conclusions is that only about a quarter of the gap between male and female earnings is due to sex discrimination. To account for the rest, the authors point to factors such as the effects of discrimination on service (hindering, among other things, progress up incremental salary scales), the greater tendency for men to work more overtime and shift-work, and the tendency for married women to restrict their search for jobs to areas dictated by the location of their husband's work.

In terms of employers' recruitment policies, studies conducted in the West Midlands and in Scotland which are reported in *Tackling Discrimination at the Workplace* support Joseph's argument that "little evidence has emerged of any significant erosion in the traditional division of labour by sex" (*Women at Work*, page 141). For example, the studies point to a strong tendency for employers to replace a previous job-holder with someone of the same sex, apparently imbuing the job with attributes of its former occupant.

To some degree these books are complementary, one seeking to document the development of female participation in the workforce, the other concentrating on the extent to which differences between male and female earnings and recruitment are the result of sex discrimination. A combined reading also partially overcomes certain weaknesses of each, such as

Joseph's lack of detailed discussion of his legislation, and Chiplin and Sloane's restriction of analysis within a wholly economic framework.

Both books offer little in the way of optimism for any marked improvement in the position of employed women in the near future. Factors such as recession, the tendency for micro-technology to have more impact upon jobs done by women than those more usually undertaken by men, the limitations of legislation and continued discrimination, suggest that at best, the situation for the female workforce as a whole will improve only very slowly. Moreover, these authors underline the argument that differences in treatment partly reflect the persistent sex inequality in other institutions in society, and without major changes in attitudes towards household responsibilities, the effect of any amount of equal opportunities legislation is bound to be severely circumscribed.

Paul Blyton

Paul Blyton is lecturer in industrial relations at the University of Wales Institute of Science and Technology.

Social dynamics

Capital, Labour and the Middle Classes
by Nicholas Abercrombie and John Urry
Allen & Unwin, £10.95 and £4.95
ISBN 0 04 301145 4 and 301146 2
Farwell to the Working Class: an essay on post-industrial socialism
by André Gorz
Pluto Press, £3.95
ISBN 0 86104 364 2

According to one sociological tradition, the relations between social classes represent the dynamics of change in societies are characterized by socioeconomic stratification, and it is the task of the sociologist to devise an account of this stratification. Gorz's book follows the first tradition, that of Karl Marx, whereas Abercrombie and Urry are disciples of the second, which owes much more to Max Weber.

Marx and Weber still provide the frames of reference for most studies of social class, and in fact rather more than half of *Capital, Labour and the Middle Classes* is devoted to a review of recent Marxist and Weberian approaches to the middle classes in capitalist society. As the authors point out, the two traditions are not always easily distinguished. Indeed, their review is so dense, and some of the material reviewed so obtuse, that it is difficult to make much overall sense out of it. The book is written as a text for students, and may be useful as a reminder of the main points of the work of Braverman or Poulantzas or a host of others. While the vastness of the array of research materials published in this area in recent years is clearly demonstrated, a comparable sense of sociological significance is not. This may not be altogether the fault of the authors, though their ponderous style does not help.

Abercrombie and Urry are more concerned to fit the middle classes into a framework of stratification than to consider class in terms of the overall dynamics of society. Routine white-collar workers are shown as increasingly de-skilled and proletarianized. Managers and professionals are seen as increasingly powerful, though not a potential new ruling class, as they remain to a large extent functionaries of capital. The framework, despite the rather obscure distinction made between occupation and relations of work, is the familiar one of stratification by occupation. This is very practical, but also somewhat limiting. One of his misgivings about such an approach is that it is associated with an unstated and unexamined assumption that classes defined in terms of occupation are the fundamental divisions in society.

Sometimes those more faithful to the Marxist tradition, whose starting point is the dynamics of class for social change, and up rejecting conventional class analysis of either a Marxist or Weberian kind. One prominent theme among such writers has been the notion of post-industrial society, and André

Gorz presents a socialist variant of this. His rejection of the working class as the bearers of socialist revolution is forceful. There is no lament of the moral sellout of the workers to consumerism, but a sharp demonstration of the dubious philosophical and completely non-empirical basis of the belief in the first place. In the modern industrial state, power is seen to be no longer exercised by any identifiable group, but is impersonally located in the system of monopoly capitalism. The notion of workers' power is therefore meaningless. The only possibility for the personal exercise of power would be in the hands of a charismatic leader of a fascist state.

This is not, however, a pessimistic book. The technology and productive forces of modern capitalism, while demanding increasingly alienating work, do, nevertheless, alter the potential for the development of individual creativity and autonomy through the possibility of drastic reductions in the hours of work as wage labour. People can have much more time for non-commodity production, for caring for their own children, growing their own vegetables, or building and improving their own houses, for the creation of use rather than exchange values. This is also, he suggests, what people want, quoting surveys showing preferences for more free time rather than more pay.

Gorz's vision is unashamedly utopian: there is little attention paid to international and other economic implications, which might present some rather thorny problems, but there are some immediately practical recommendations - notably work-sharing. The vision is not of a society of leisure, now an unenviable reality for millions of unemployed. Gorz does not set much store by the mass production of leisure entertainment for the consumption, though he does not deny the use of advanced technological products such as video cassette recorders.

Abercrombie and Urry would, I think, regard Gorz as an ideologist of the radical middle class. Gorz is indeed a socialist writer, but his work nevertheless, if the sphere of paid work is no longer central to people's lives, then we should not look to occupations or work relations for the sources of change in society, but to relations, movements and activities outside work. Perhaps the significance of occupational class is overrated.

A reader of *Farwell to the Working Class* would stimulate more profound thinking about social class than Abercrombie and Urry's thorough, meticulous if rather dull textbook.

David Berry

David Berry is senior lecturer and head of the department of sociology at University College, Cardiff.

'I never done it'
Variation in an English dialect: a sociolinguistic study
by Jenny Cheshire
Cambridge University Press, £16.00
ISBN 0 521 23802 1

This is a sociolinguistic study within the framework established by the American linguist William Labov, and made known in this country largely through the work of Peter Trudgill. The approach is sometimes referred to as "correlational sociolinguistics", in that it seeks to relate features of language to features of the social context.

Jenny Cheshire's study is an important work in this tradition, for it makes innovations both in methodology and data analysis, and contributes significantly to what we know about non-standard English. It must be said that it does not critically question the assumptions of the Labovian approach - in particular, the extent to which an explanatory account of language can be achieved through the correlation of linguistic features with separately defined social categories - but it shows by example both the strengths and weaknesses of such an approach. Cheshire's study has several novel and interesting characteristics: her focus on the morphology and syntax of adolescents' speech, her methods of collecting data in adventure play-



This 1937 poster for the Rural Electrification Administration in the USA is reproduced from Philip B. Meggs's *A History of Graphic Design* (Allen Lane, £25.00).

grounds, her discussion of the relation between vernacular culture and linguistic behaviour, and her re-evaluation of the assumed relationship between language and sex and language and social situation.

Whereas earlier work on English dialects focused on the elicited speech of the older inhabitants of rural areas, recent sociolinguistics has studied the spontaneous speech of people of various ages in urban as well as rural settings. In keeping with the newer approach, Cheshire conducted her study in Reading, among groups of teenagers. Because she was interested in variation in the non-standard data in adventure playgrounds, where adolescents met on their own terms, outside the institutional setting of schools. Her account of how she became accepted in the groups as a participant observer with a tape recorder is a most interesting and helpful account of fieldwork methodology.

In her analysis of the tape recordings, Cheshire concentrated on morphological and syntactic features of the adolescents' speech, thus distinguishing her work from that of Labov and Trudgill, with their emphasis on phonology. She calculated the frequency of nonstandard features such as present tense forms with 's' (*I does, we has*), past tense forms such as *I done, seen*, the verb form *ain't* (negative concord (as in "I couldn't get no sleep"), and *never* as in "I never went to school today". Her analysis shows how the use of some of the nonstandard features is affected by the kind of sentences in which they are found.

In attempting to relate language to social factors, Cheshire's focus is on linguistic indicators of subdivisions within the group. Following Labov's success in relating language to peer group status in groups in New York City, she tries to correlate group membership in terms of core and periphery to linguistic features. Finding less of a correlation than did Labov, she looks for a correlation in terms of differential adherence to the vernacular culture, which she quantifies in an original way according to elements of the vernacular, non-legitimate culture. Such elements include the carrying of weapons, criminal activities, fighting and swearing. For the boys, certain innovations both in methodology and data analysis, and contributes significantly to what we know about non-standard English. It must be said that it does not critically question the assumptions of the Labovian approach - in particular, the extent to which an explanatory account of language can be achieved through the correlation of linguistic features with separately defined social categories - but it shows by example both the strengths and weaknesses of such an approach.

Cheshire's study has several novel and interesting characteristics: her focus on the morphology and syntax of adolescents' speech, her methods of collecting data in adventure play-

overall. In addition, nonstandard past tense *come* and *ain't* as a copula mark vernacular loyalty for the girls. *Come* is interesting in that it also distinguishes the girls from the boys (the girls use it variably, the boys constantly) and negative concord distinguishes the girls from the boys, who use it more frequently.

These findings are interesting in the light of previous work which has suggested that women use fewer nonstandard forms than men. While this is broadly true for Cheshire's data, her examination of individual features shows that features may function differently in the girls' and boys' groups. Cheshire also contributes importantly to the analysis of stylistic variation. Following Labov, it has been assumed that the speech situation can be measured on a unidimensional continuum, with formal at one end, defined by maximum attention to speech, and informal at the other, defined by minimal attention. If this assumption were correct, Cheshire's comparison of recordings made in the adventure playground with some made at school with teachers, would presumably show a uniform reduction of nonstandard features at school. While some speakers do show such a reduction, others do not, and the difference is convincingly explained by the nature of the relationship between the teacher and the pupil, as well as the number in the group. Cheshire's analysis thus points towards some amalgam of the individual-oriented approach of social psychological "accommodation theory" and the Labovian group-oriented correlational sociolinguistics.

Cheshire's study is a useful contribution to sociolinguistics. While showing that a correlational approach does yield some interesting results, her analysis should raise doubts about the Labovian assumption of independently definable social parameters operating on language, and about the assumption that a speech community can be defined in relation to shared norms.

Margaret Deuchar

Dr Deuchar is lecturer in linguistics at the University of Sussex.

To be Published in Oct '83
PULMONARY PHYSIOLOGY

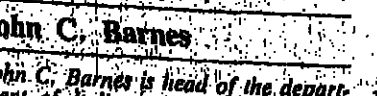
A handbook for Medical Students
by Dr Ashraf Husain
Asst Prof of Physiology
King Saud University, Riyadh
Price £12

COSMIC PRESS
83 Carlingford Road
London N15 3EJ

Where, then, does this leave the reader of Yeats's poetry? Without the

At times the presentation of materials swamps the topic they are meant to illuminate. "I never may remind myself that 'It is not my business to relate the events of the French Revolution', but he slides into long explications of apparently irrelevant materials on that and other occasions. His foreword worries that he should have waited until he had 'read a blimp' and been able to add pertinent ex-

act significance of such phrases as "The death of the heart" and "The departure of the soul"; thus counteracting the "derivative" convention-



A. Gekoski

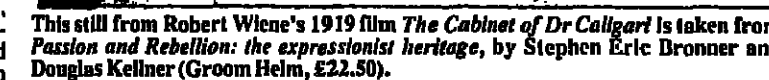
What Grayling's book aims to introduce its readers to is hence nothing less than what, at present at least, stands out as the most distinctive preoccupation of twentieth-century English-speaking philosophy: its belief in the central importance of philosophical

who know and feel themselves
partners in the national community
is not hard to trace the influence
these ideas on the fundamental

Of Liberty reproduces the texts of 1 of the lectures given under the auspices of the Royal Institute of Philosophy.

So keen was the debate that the philosophical and theological questions raised, and the solutions offered for and against miracles, are far more profound than anything to be found in contemporary discussions of the subject. This is not to suggest that the controversy about miracles is the eighteenth century's most important theological legacy. Dr Burns draws attention to the unique case of Arminius

T.A. Roberts



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T.A. Roberts

BOOKS

Quantum digest

The Historical Development of Quantum Theory by Jagdish Mehra and Helmut Rechenberg
Volume one: The Quantum Theory of Planck, Einstein, Bohr and Sommerfeld

Part one and two: Its Foundation and the Rise of Its Difficulties, 1900-1925

Springer, DM75 and DM85

ISBN 3 540 90642 8 and 90667 3

Volume two: The Discovery of Quantum Mechanics, 1925

Springer, DM65

ISBN 3 540 90674 6

Volume three: The Formulation of Matrix Mechanics and Its Modifications, 1925-1926

Springer, DM75

ISBN 3 540 90675 4

Volume four, part one: The Fundamental Equations of Quantum Mechanics, 1925-1926

Springer, DM75

Part two: The Reception of the New Quantum Mechanics, 1925-1926

Springer, DM75

ISBN 3 540 90680 0

These painstaking volumes show clearly that there needs to be more critical dialogue between physicists writing history and historians of physics. For the presumption of the series (presently four of nine volumes) is that "appropriate telling" of history of recent science consists in précis of published research papers *verbatim* with biographical details of the major contributors appended as footnotes. Little or no synthetic interpretation of the material is given save that implied by the division of the story among the many volumes. I must say that the history of physics alone the definitive history "properly and adequately" discussed, that this work pretends, but fails, to be.

The general subject is the crucially important shift in our physical understanding of the natural world from the electromechanical determinism of the late nineteenth century to the indeterministic and fundamentally statistical quantum physics after 1925. The senior author, who claims responsibility for all prose, has approached the evolution of quantum mechanics with unabashed veneration for its architects. This has produced an uncritical, hagiographic and historically only marginally useful digest of numerous technical papers. The vast project is helpful for understanding the physics involved and is wide-ranging in technical bibliography. But between the lines falls any significant discussion, or even consideration, of social, political and institutional factors that demonstrably influenced the course of events described. World war and social revolution pass with hardly a comment; economic inflation, worse by orders of magnitude than that enervating today's economy, apparently left physicists and research budgets untouched; growing anti-Semitism and anti-rationalism in "German" society severely affected physics; relations with institutions and each other, if future volumes follow the pattern, will present the persecutor and exodus of German-Jewish scientists as but a ripple on the intellectual waters agitated by the application of the new quantum mechanics.

There is nothing wrong with internal studies of developing science, they can be quite illuminating. But they never provide a complete picture; and as this work proclaims historical authority, there may be a danger that scientists unfamiliar with historical investigation will accept it as history. Convinced through a retrospective view of their discipline that "bothersome" complex social and economic factors had little influence on the logical evolution of concepts, many may take this digest of ideas - carefully compared (by the chief author's admission) to the post-hoc reminiscences of the plants - as fortification of this restricted view.



Right hand of Grubbe man, found preserved in a peat bog near Silkeborg in Denmark. Carbon-14 dating provided a date of AD 1800 (plus or minus 100 years). Taken from *Antiquities, Disease and Ancient Cultures*, edited by Aidan and Eve Cockburn and published by Cambridge University Press at £9.95.

point. That the treatment is expressed in mathematics, whether historically justified or not, simultaneously gives a veneer of technical authority and excludes the uninitiated from the true "topic story". In his long preface, Mehra reveals the limits of his insular view of history: only Wolfgang Pauli, chief physicist-critic and partner-architect of the new physics, could write the definitive history of quantum mechanics.

The volume on Werner Heisenberg's search for matrix mechanics has, we are assured, Heisenberg's personal "approval"; Pascual Jordan, a major contributor to the probabilistic interpretation of the new mechanics, also "approved" the content of the relevant volume before he, too, died. This further underscores the limitation to the individual intellectual contributions in the story and raises serious historiographical issues. Why is it Heisenberg, and not (say) Max Born, whose approval is valued? So many names of physicists as participants or witnesses are paraded in the preface as to give the impression of encyclopedic completeness and uncontroversiality of interpretation. The display implies what is patently untrue: that all of these persons agreed or agree as to the facts.

The work is impressive in size and in bibliography, reflecting Pauli's quoted compliment of Born and Jordan's 1930 treatment of quantum theory, "the get up of the book, as far as printing and paper are concerned, is splendid". The treatment of extensive material and the size of the bibliography reveal the considerable amount of work that Mehra's co-author has clearly put into the organization, examination and analysis of published papers, resulting in conceptually useful abstracts of research. However, although the bibliography includes several important studies by historians of recent physics, it is by no means complete. Many influential and important historical analyses are omitted, and those listed are rarely discussed or credited with interpretations given in the text. In several instances - detailed discussion of atomic structure, of optical and x-ray spectroscopy, especially the anomalous Zeeman effect and x-ray absorption, of the influential discovery of element 72, of reaction to half-integral quantum numbers - Mehra's interpretations are remarkably similar to, or are clearly in reaction to, those from uncited historical research. Curiously, Mehra's independent assessment frequently coincides with previous historical studies, the inaccuracy or assumed lack of which fed him and his advisers to conclude that there was "no time to waste" in setting the record straight.

In one of the few places that Mehra discusses the work of historians, he criticizes T. S. Kuhn's claim that Pauli, Ehrenfest, Heisenberg and Planck's early work on the quantum theory: Mehra objects that the letters do not exist. This letter in question was from Ehrenfest to Planck and does not constitute the "birth" of Kuhn's detailed argument for why they were only presumed to have existed.

Most of Planck's *Nachlass* was destroyed in World War II. Yet, Mehra claims categorically, "there is only one letter of Planck to Ehrenfest, dated July 6, 1905, on file, none later". In fact there are 36 other letters and cards from Planck to Ehrenfest (and three in return), all of them "later" and contained in the collection available on microfilm since 1972 that holds the single letter known to Mehra. So much for the completeness of the "matching, comparing, and checking" against contemporary documentation that is claimed to have justified the extraordinary and pervasive reliance in the construction of these volumes on Mehra's recollections of physicists' informal reminiscences.

Although the volumes are of restricted usefulness, they are certainly

A change of memory

Dynamic Memory: a theory of reminding and learning in computers and people by Roger C. Schank

Cambridge University Press, £18.50 and £6.95
ISBN 0 521 24858 2 and 27029 4

In their book *Scripts, Plans, Goals and Understanding* (Lawrence Erlbaum, 1977), Roger Schank and Robert Abelson first addressed the problems associated with the design of machines which can understand language. That book came to the conclusion that comprehension was largely conceptually driven. Organized knowledge structures were said to generate expectations about what is likely to come next in a story about, say, a car journey or a visit to a restaurant.

Although this notion has not been accepted universally - as it leads to the prediction that we should not understand unexpected events - it has been implemented in a program called *Frump*, which summarizes news stories. *Frump* doesn't comprehend by attempting to synthesize meanings out of words and phrases, but by predicting what it will see, and then checking for words and phrases which will confirm its expectations, rather like the caricatured speed-reader.

Roger Schank now acknowledges that the earlier model of language processing tended to neglect the importance of knowledge in comprehension, and goes on to suggest how memories grow and organize themselves so that we can benefit from our experiences. His new book will undoubtedly generate much more discussion among psychologists about the organization of human memory and about the design of systems which can store and retrieve information.

Dynamic memory is a storage system which can not only accumulate new information, but also change its organization with new experience. A simple example of this would be a child discovering that a dog called "doggy" and a cat called "cat" are different animals. The organization of the system, accordingly, is dynamic: memories, therefore, are what people have and what computers

not worthless, as some illuminating discussions may turn out to be valid and original; and many of the footnote biographical sketches include useful new findings. Also, as the period after the invention and elucidation of matrix mechanics has not been widely assessed historically, the authors' biographical and abstracting work here may prove helpful - if used with caution - in the slow process of historical elucidation.

Bruce Wheaton

Bruce Wheaton is assistant director of the Office for History of Science and Technology at the University of California, Berkeley, and co-compiles of "Literature on the History of Physics in the Twentieth Century" (Berkeley, 1981).

should have if they are to behave intelligently.

This is particularly true for the so-called expert systems with large, specific data bases - systems that are most effective only when they can reorganize themselves in the light of new inputs. An example of this is given in a final section, written by Janet Kolodner, which describes a knowledge-based system called *Cyrus*, which attempts to understand international diplomacy. *Cyrus* contains a data base about such things as politicians, diplomatic visits, speeches and negotiations, and accepts news items summaries from *Frump* as data to be entered through an indexing system.

Events are then categorized, the resulting generalization allowing recognition of similarities between events. This is a critical property, as generalization aids the retrieval of information which is not indexed.

A central role in Schank's theory is given to the process of "mind-reading", which serves to point out the superficial similarities between events. Being reminded of a previous event is a natural product of attempting to understand a current event. The process also aids to update the organization of our memories, and is seen as the basis for new learning. Whereas work on memory has previously been concerned with such esoteric issues as proactive interference in forgetting and the cause of acoustic confusion effects, Schank's processes account for how *War Side Story* can remind us of *Romeo and Juliet* - an unquestionable improvement in the public validity of memory research. As a central point is the importance of reflection and review for understanding, the book also provides a justification for nostalgia.

The theory is not dependent to any extent on existing work on the psychology of memory, and indeed is remarkably free of the encumbrance of support from the literature. Although the importance of the notion of categorization and generalization in concept formation was recognized long ago by cognitive psychologists, Schank has now formalized its role. It is an appealing, though unsupported theory, but well worth pursuing.

Geoffrey Underwood

Geoffrey Underwood is lecturer in psychology at the University of Nottingham.

Wave devices

Wave Energy: a design challenge by Ronald Shaw
Ellis Horwood, Wiley, £18.50 and £8.50
ISBN 0 85312 382 9 and 508 x

It is now nearly ten years since OPEC countries gave us the price rise shock, and turned attention to finding new sources. Getting energy from waves seemed a splendid idea. The mechanical characteristics of the power yield were, for a while, a source of good. Furthermore, the efficiency of wave models was very high.

By any standards, the achievement of teams devising mechanisms exploiting wave energy are outstanding. We now have designs for structures which could produce energy at a cost below that of the oil plant which was so much in vogue in the 1960s. The economics have more favourable if the capital costs are made equal on the true return investment achieved by the power boards. Costs continue to fall, efficiency of energy capture has improved, and methods of wave to extremes of force have been developed which ensure that wave devices will survive in conditions which normal ships would be unable to withstand.

Ronald Shaw has written an account of the various types of wave energy which he has obtained. He first outlines the energy scene and the wide range of opinion about its future. This is followed by an historical survey of the pioneering work of the United States, France, the United Kingdom and Masuda in Japan, and an outline of mechanical devices which could be used to harness wave motion.

Shaw then introduces the foundations in two chapters of the properties of water waves, the characteristics of real seas, the hydrodynamics of devices near waves. Waves have always attracted attention of the finest mathematicians and some of their papers are included in a *Shaw* paper, mathematical content exactly of this and these two chapters (an appendix) constitute a valuable section of the essential equipment, which should be included in the undergraduate and postgraduate libraries.

The book next reviews the work which hydrodynamic principles can be improved, beginning with principles of low-pressure waves, which were developed especially for wave energy and which operate elegantly on alternating flows. There are also sections on high-pressure equipment, gyroscopes and machines, the only omission being the tube pump which has power to be generated from a wave line. The book ends with a section on construction materials, and ecology, and then a comprehensive list of references.

The book provides a fair and balanced account: few inventors feel aggrieved. Shaw manages to avoid the political controversy surrounding the proposed abandonment of the British renewable energy search programme. He does, however, have perhaps a discussion of the implications for countries with energy crisis and the significant progress so far.

S. H. Salter

S. H. Salter is reader in mechanical engineering at the University of Edinburgh.

A second edition of C. V. Cowling's *A. D. Hope's Engineering Materials* has been published by Pitman at £9.75. This detailed, practical text has two new chapters: on the industrial engineering materials and on the properties of materials. It includes the concept of uncertainty and measurement of liquid and solid

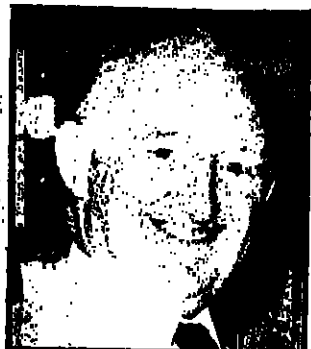
NOTICE BOARD

Appointments

Universities
LOUGHBOROUGH: Dr Peter Mann, formerly reader in sociology at the University of Sheffield, is to take up the post of director at the Centre for Library and Information Management at Loughborough University.

SURREY: Lectureships: Dr P. Sweeney (digital electronics); Dr D. J. Jefferys (telecommunications); Dr A. Hum (mechanical engineering); Dr C. P. Hale (management studies); Dr R. A. Quierri (management studies); Mr F. A. Buttle (marketing) - all temporary. Dr N. K. Howell (food science).

EXETER: Lectureships: Dr A. N. M. Ayubi (politics); Dr M. L. Brown (pure mathematics); Dr R. A. Cobley (engineering science); Dr C. J. Heller (statistics and econometrics); Dr I. D. Saller (chemistry); Dr I. M. Sheldon (economics); Dr M. L. Smith (education); Dr A. J. Wilmut (applied mathematics); M. Yazdani-Najafabadi (computer science).



LEEDS: Professor Duncan Downson, (above) of the University of Leeds department of mechanical engineering, has been appointed the university's new vice-chancellor for a two-year term. Professor Downson is an expert in tribology, the study of interacting surfaces moving relative to one another, of which lubrication plays an important part. He was awarded the Tribology Gold Medal in 1979.

General
Professor V. S. Orfitelli, formerly vice-chancellor of the University of Surrey, has been appointed as community affairs officer within the Bureau of Industrial and External Liaison. Professor Orfitelli will assist with the promotion of university-community links.

Mr Fred Lightfoot MBE, former deputy director of the Commonwealth Development Commission, has been appointed project co-ordinator at the new inter-college science centre at the University of Warwick. He is based in the science centre, which is a major resource base where a wide range of people - schoolchildren and adults - will be able to reconstruct and repeat the classic scientific experiments with both contemporary and modern equipment.

Open University programmes

Saturday August 27

6.00 *British Social Science* (S34, prog 14).
6.15 *Politics, Policy and Administration: The Diploma* (D234, prog 14).
6.30 *Language Development: Subject Test (E232A)* (E232A, prog 14).
6.45 *Language Development: Subject Test (E232B)* (E232B, prog 14).
6.55 *Language Development: Subject Test (E232C)* (E232C, prog 14).
7.00 *Language Development: Subject Test (E232D)* (E232D, prog 14).
7.15 *Language Development: Subject Test (E232E)* (E232E, prog 14).
7.30 *Language Development: Subject Test (E232F)* (E232F, prog 14).
7.45 *Language Development: Subject Test (E232G)* (E232G, prog 14).
7.55 *Language Development: Subject Test (E232H)* (E232H, prog 14).
8.00 *Language Development: Subject Test (E232I)* (E232I, prog 14).
8.15 *Language Development: Subject Test (E232J)* (E232J, prog 14).
8.30 *Language Development: Subject Test (E232K)* (E232K, prog 14).
8.45 *Language Development: Subject Test (E232L)* (E232L, prog 14).
8.55 *Language Development: Subject Test (E232M)* (E232M, prog 14).
9.00 *Language Development: Subject Test (E232N)* (E232N, prog 14).
9.15 *Language Development: Subject Test (E232O)* (E232O, prog 14).
9.30 *Language Development: Subject Test (E232P)* (E232P, prog 14).
9.45 *Language Development: Subject Test (E232Q)* (E232Q, prog 14).
9.55 *Language Development: Subject Test (E232R)* (E232R, prog 14).
10.00 *Language Development: Subject Test (E232S)* (E232S, prog 14).
10.15 *Language Development: Subject Test (E232T)* (E232T, prog 14).
10.30 *Language Development: Subject Test (E232U)* (E232U, prog 14).
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3.15 *Language Development*

Don's diary

Sunday

Heat in Holland Park, the sent by a sunny pond and time to structure a schedule for the remainder of the summer vacation. Administration for 1983/84 is well in hand and the remaining weeks promise some productive writing. There's that partly revised paper in the office, strategically parked to catch my eye and stimulate activity; more lectures - and the book, abandoned some three years ago when occupying the new chair at Bradford became incompatible with meeting publisher's deadlines. And then the cuts of '81 and the chaos of reconstruction but now, perhaps, one might dream a little? The sun encourages optimism and the thought of future release from chairmanship of undergraduate studies generates hope, so why not outline a revised introduction?

Monday

The CIBA Foundation's hospitable welcome, a mix of old friends and new acquaintances and the topic of *Medical education today - a delusional experience?* Among old friends at the meeting are psychologists with whom I attempted to plan pre-clinical courses for contemporary medicine: it's an area of activity missing from the Bradford existence so I was happy to have CIBA's invitation and to catch up with mergers and their consequences.

Tuesday

To the SSRC via Gray's Inn, Lincoln's Inn and down to the Temple - Norman doorway, medieval garden. Then into the SSRC's modern world of *Microcomputers and Education*. The discussion is stimulating and generates notions for research at Bradford. We have some microprocessor development and - more important - research links with the school environment. What becomes evident is the need for an interface between university groups and classroom staff: perhaps we could facilitate the translation of academic ideas into practical reality?

Back to the hotel via Covent Garden: we were married there, in the Crown Court church which is embedded within a theatre where fruit loaves competed with wine guests for the developing ambient atmosphere of that fascinating area. But now a total transformation in this new world of wine bars, boutiques and up-market bookers.

A Bradford phone message from the department: will I ring back tonight, but the call came from a sensible soul who would have indicated any urgency to a resumption of good news - perhaps a job for that psychopharmacological postgraduate? A leisurely bath, change and the phone. But it is not good news: the unexpected and imminent departure of another of the academic staff, bringing the total for our 1983 turnover to 50 per cent. And the losses are of expertise in computing, research design, statistics, human information processing and performance efficiency - essential aspects of experimental psychology which are relevant to the technology explosion. It is a sad, sad day, despair, frustration and anger: what of all that dead wood which was to drop from university trees after the 1981 making?

Wednesday

A wake at Bradford's central processor: back to have been active through the

sleeping hours and a two-page memorandum structures itself, paragraph by paragraph: we need action - urgent action.

Back in Bradford the new Undergraduate Chairman mums something about storms and lightning damage to equipment in our research unit, but I barely hear. The office is busy (where are those pools of vacation time quiescence described on the back page of *THESE*?) but the memo gets typed, duplicated, delivered to various recipients - then the murmuring about lightning has an opportunity to make an impact. Our research unit is used off-campus in the attic of two Victorian villas. Lightning has damaged the computer and a microcomputer: the mini but interfaces have been affected and our technicians' work ruined.

At the end of the day I drive slowly home, by the longer route which will take me down a beautiful Pennine valley. At its nearer end I stop, some 1,000 feet above sea level, then look along the moorland, the meadows and downward to the weaving hamlet where we live. Still there is sun, as there was in Holland Park, but that hypothetical schedule has shifted somewhat since Sunday!

Thursday

An unexpected visit from one of our honorary research fellows: he's hard-working, enthusiastic and still searching for funding. We plan together and I promise to write more letters - then back to the reshuffling, the telephone calls, the talk, talk, talk. Thank Heaven the staff have, as always, rallied round and responded immediately to the need for new thought on timetables and teaching proposals. A conference plans begin to take shape in the pieces of decimated courses.

Off to the district health authority - impending cuts there, but a competent chairman and a cohesive management team: chat with them after the business, then home to television escapism.

Friday

Phone call from a Bradford professor recovering from coronary thrombosis: news of another professional casualty, now safely out of intensive care. Chat with our dean of life sciences: mutual regret that academic staff are unacceptably overloaded, secretaries overstretched. More planning: talk, phone calls - then sandwich lunch in the bar with psychology staff and a mature student working as a research assistant throughout the vacation. He's a lively, cheerful soul who, together with the lunchtime gin, lifts my morale!

Back in the office we try to prepare undergraduate material - course outlines, student handbook and so on, but there's no alternative to postponement until late September: there will be frantic scramble, almost inevitable errors, and a general feeling of frustration.

Saturday

Again awake, at 4am, churning over recent events, recalling an administrative opinion that some academics live on this hand-to-mouth existence. Oh yes?

Asleep again until 8.00 when spouse brings breakfast tray and a different view of son: kitchen sink philosophy and delight that daughter passed her law exam.

Gradual unwind and Bradford recedes: also recording is the book, but the bathroom scales tell me that since last Saturday I've shed two of the surplus pounds acquired during summer term examinations!

Margaret Christie

Long hot summers are few and far between in this country. And they always seem to coincide with my forays into the world of policy-making and administration. In 1976 I found myself sweating on the fourth floor of the Cabinet Office from 9.30am to 6.30pm. This year I am locked into county Hall for the same hours. Were I still an academic it would be the vacation and while not exactly a holiday I would have set up my card table in the garden and quietly got on with reading and writing in the sun, which like some ancient civilizations, I worship. In fact people keep asking me how much holiday I get as a local government bureaucrat. The reply is a snappy - six weeks - and that's no longer than I took as an academic! But I have to admit that though the length of the holiday taken is no different I do miss working in the sun.

Holidays can in any case be overrated. Some of the worst time of one's life are on holiday. Several of the men in my life have recognized this, although I always fought them, because they took it to extremes. My father agreed to going on holiday with his family twice during my childhood. My main memory of one of these occasions is of him miserably pacing the beach in the rain in a specially purchased pair of green slacks and sandals, which he never wore again.

My ex-husband had a similar aversion to leaving home. When abroad he missed his confidantes desperately and was always the first to succumb to salmonella poisoning and the ghastly consequences of not being able to abandon close proximity to the lavatory. Copper-coloured hair and the complexion that goes with it led even to his toes getting sunburnt if he was not enough to remove his socks. And he being much of a swimmer he had a strong aversion to beaches and the sea.

When foolishly dragged by me and some close friends on a Welsh seaside holiday he spent much of the time locked in the car by the side of the beach, escaping from the sun and children alike, as he worked his way through the novels of Tolstoy. How much more comfortable to have done something at home. My son's behaviour on holiday last year, (disappeared on a Friday last year, suggests that he may have inherited the aversion to relaxation in familiar surroundings, shared by his father and maternal grandfather. But perhaps it was just that he had passed the stage where a holiday with his mother, his mother's boyfriend and his younger sister was appropriate.

Going away with people who prefer to take their holidays at home is in my experience almost as bad for the enthusiastic traveller as for those who did not want to go. The "stay-at-homes" seem to have an uncanny ability to make those who pushed them into going

Weather fine, wish you weren't here



Tessa Blackstone

away feel guilty. If the beds are hard, the weather wet and cold or the food lousy it's the fault of those who thought up the whole thing. After a long and desperate search for a British paper to make them feel at home has been achieved, pointed references are made to the fact that it's 75° and sunny in London.

Familiarity with surrounds breeds advantages

Discussions are started about whether it is possible to change the air ticket or bring forward the ferry reservation. Various minor psychosomatic illnesses start occurring and conversation comes round to the question of whether you can trust foreign doctors or foreign chemists. Getting from one place to the next starts to become an enormous hassle with arguments about the route, map-reading and who is going to drive.

Worries start surfacing about the two papers that have to be prepared for the September conference season with the inference, "if you hadn't dragged me here I could be quietly working on the last home". And so on and so on. The long hard lesson as I have been telling my mother for years is that it is better to go away without them than in a relationship when both partners

in a relationship want to go on holiday it does not always turn out to be the hoped for idyll even if the objective conditions are good. Holidays can put a strain on the best of relationships even when both partners want to go.

Union view

Getting things into another perspective

Following the publicity given to the Leverhulme Report, June and July saw the publication of two consultative documents which are potentially of much greater significance for public sector higher education: the CNAA paper on *The Future Development of Graduate Level* and the National Advisory Body's document *Towards a Strategy for Local Authority Higher Education in the Late 1980s and Beyond*. Both documents, while providing different perspectives, are remarkably similar to the issues to which they

fore establish the parameters within which the debate about higher education will take place.

It is important that these parameters are called into question for a number of reasons. For example, neither document says anything very specific about provision for mature students, other than discussing how to improve access and more flexible course patterns. The recent Manpower Services Commission consultative document *Towards Adult Training Strategy* clearly indicates ways in which non-traditional approaches to provision for adults, particularly evening classes, should be used.

But this issue is only raised obliquely

Yet there is little in the NAB paper which reflects their recently published comments on the MSC strategy paper, in which the dangers of creating an artificial distinction between training and education and the apparent lack of awareness by the MSC of developments in continuing education in recent years are highlighted.

NAB has expressed its fears that while paying lip service to the concept of partnership with the education service, the MSC appears to anticipate having a leading role in the development of adult education and training. Given these worries, which NAB shares, it is curious that the NAB strategy paper is so unimaginative concerning provision for mature students.

Perhaps more surprisingly neither document comments in detail on relations with the university sector and, of course, the NAB only deals with local authority higher education, although clearly the universities help to set the agenda for higher education development and constrain the possibilities for change. This is as true for the CNAA as it is for the NAB and is reinforced by the inclusion on the NAB of a representative from the University Grants Committee.

But this issue is only raised obliquely

The author is the assistant secretary higher education, of the National Association of Teachers in Further and Higher Education.

The structure of normal daily life, which helps keep people going, is too much contact, is suddenly disrupted. There is a plethora of decisions, many of them trivial but most of them potential source of disagreement and irritation that have to be made. What time to stop for lunch; which restaurant to go to; where and when to break the journey at night; which museum to go to; whether it is too hot for the beach; not hot enough.

Saintly people never stoop to conflict about such matters; but most do not acquire this state of grace. Another problem is that while it is a substantial part of the day is spent away from spouses, partners and children, on holiday it is hard to get away from them. The saintly response is to the purpose of a holiday is to be with one's loved ones. True, but how much you care for them a little break can go a long way.

There is, however, a solution. For many years I thought the upper middle class intelligentsia, predilection for buying houses in Tuscany or Provence had more advantages and the severe disadvantage of tying one down and all the tedious responsibilities of ownership. But what makes it approach to holidays attractive is that it provides the advantage of a break and a change of surroundings without the strains that unfamiliarity can impose. It is in fact much more pragmatic than has previously realized.

As long as the house is large enough, friends can be invited to share in pleasures and dilute the alternating arguments and boredom of the nuclear family. And there will probably be somewhere to escape for peaceful reading or even writing conference papers. The local restaurants can be explored at leisure and rated for food, wine, ambience and price, so that parsimonious feelings are predominant the cheap ticket is selected and where more luxurious mood prevails somewhere more luxurious can be chosen. There is no need to go on a time-consuming search for the best shop or the public tennis courts because their whereabouts has been established.

Perhaps it is a sign of middle age that holidays, which involve relaxing and reading in some quiet and sunny corner seem more attractive than they used to be and more appealing. If less adventurous, than long journeys to unknown places that quite often turn out to be a disappointment. Perhaps it is a sign of becoming blasé about glamorous far away places. While an offer of a trip to Western Samoa would be hard to turn down, I have increasingly been convinced that the vital ingredient is not the place and what it has to offer, but the holiday companions and what they have to offer. If they wish they were at home I start doing so too.

when NAB articulates the fears that the local authority sector could develop "second class" status if it were to be uniquely identified with development such as two year degree courses or radical departures from the present mode and pattern of provision which might initially be seen as less desirable.

However, it is true that the two documents do address themselves to a number of issues which have effectively been placed on the agenda by discussion both by the government and the present climate of constrained resources. The agenda can therefore too easily appear "radical" while still being "new" or "different". Perhaps inevitably given NAB's terms of reference, resource constraints are not challenged so that questions of improving access are too easily transformed into questions about improving credit transfer, or redistributing existing resources to more people.

Throughout the debate it will be essential to point out the ways in which the questions about higher education are far from open ended. Obviously, if we identify what is possible over the next few years, but if we lose sight of longer term goals to transform the higher education system, giving genuine open access and a comprehensive level of provision, we will allow the system to become permanently distorted. NAB for one, intends to ensure that this does not happen.

Jean Bocock

LETTERS TO THE EDITOR

Criteria by which research should be judged

Sir, - I am writing out of sheer disillusion with the current system of university postgraduate research studentships. Your pages have on occasion contained discussion of low submission rates for postgraduate dissertations. Perhaps my experiences might throw some light on this.

I registered in 1977 for a MSc by research in sociology and received a full-time Social Science Research Council grant for two years. Originally I had hoped to upgrade to a PhD and to extend the grant for a further year. My research was tailored accordingly. At the end of the first year, the work was not as advanced as it might otherwise have been. I have been lucky in that, contrary to the experience of some students, my relationship with my two supervisors has been on the whole reasonable and pleasant. However, in assessing my work at the one-year-on-stage, they did not feel that they could recommend upgrading. Their stance was, I believe, compounded by the view, held in some quarters of the department, that women students with young children do not complete and submit (although at least two women students with children have succeeded in gaining PhDs in the department in recent years).

When my grant ended I started part-time, hourly-paid work at the polytechnic while continuing my research as best I could with a husband and a small child who attended the university nursery three days a week. I was as much as I could afford. I continued to have a desk in the sociology department which provided crucial, relatively undisturbed, workspace. Perhaps more importantly, it also maintained the informal contacts with staff and other students which I had established over the two full-time years. In this particular department there was no formal forum for research students other than twice-yearly seminars in which those currently on an SSRC grant were required to give an annual working paper.

Two years ago, having just got his degree, my husband began an affair with one of the sociology department lecturers who then offered to support him while he looked for work if he would move to live with her. They now have a house together. The point of mentioning this is, of course, that her intervention in my private life has, inevitably, had ramifications beyond the domestic sphere. Given her salaried position within the department, and given the antagonism between us, it was I who was put in the position of moving out from the department thereby losing contacts, encouragement, and support. On the whole I believe that I was rendered invisible in any formal departmental terms.

Divorce impending, with a small child to support, I nevertheless continued to write up my research in (Open University and polytechnic), also taking on whatever other work came my way as a writer and as a lecturer. Eventually I submitted my thesis last November with, I believe, the general approval, support - and relief? - of my supervisors. I believed,

and still maintain, that it is of reasonable standard for a masters degree. However, the external examiner, whose work I generally respect, insisted that the work should be rewritten in places. Ironically, one of her recommendations is that I reorganize material to foreground my political perspective. As it happens, this would conform to earlier intentions which were changed at the recommendation of one of my supervisors because of the "lucky dip" nature of the appointment of external examiners and the, as they saw it, danger of antagonizing the political position. This is, of course, perfectly valid advice given the unpredictable circumstances. Postgraduate dissertations are in the peculiar position of being addressed to an unspecified audience in terms of academic and political preoccupations within the specialist field. The examiner, as reader, holds an unparalleled degree of individual power over the particular writer. Meanwhile, I gather that the internal examiner has indicated that he had considered the work acceptable. However, in these instances the external examiner's opinion always prevails.

The external's set of comments are, of course, in many ways pertinent: a piece of work is perfect, and I can certainly see flaws and limitations to mine. However, it is a *student's* work and I have learnt a tremendous amount from the work both in terms of approaches to research and in relation to my subject area. Originally I accepted the empirical "out into the field" approach generally favoured by my department. This would not now be my approach. Besides which, as is inevitable over five-six years of study, my local interests have changed. However, the legacy of the initial empiricism combined with a shift towards an interest in more theoretical questions emerges as an uneasy tension within my thesis which, in the attempt to combine the two, has led to the point at which research material, has ended up with some unconvincing juxtapositions of which I am only too well aware. However, surely this tension precisely represents the extent of the learning process experienced. Previously I had no research experience. This, presumably, is why research opportunities are offered as *studentships*, as a form of training through first-hand experience.

There is a crucial set of issues relating to the criteria by which a masters by research should be judged, or rather, since the criteria in play are essentially the same as those applicable to a PhD, a problem of defining the appropriate "gap" in standard between the two types of higher degree. It is, it seems, clearly established that a PhD is an original, well-presented piece of research which is coherent at a theoretical level as well as in terms of the practical project undertaken. What constitutes - and should constitute - a masters is, I think, less clear. My work does, I believe, raise interesting questions, the original research was fairly extensive, and I learnt a lot from it. This, it seems, is not sufficient. What then is the distinction between a masters by research and a PhD? With

Departmental error

Sir, - Last week you published my letter criticizing your so-called peer review articles. You described me as head of applied mathematics and chairman of the University of London's board of studies in mathematics, but you omitted to give my institutional affiliation.

Now, there are 13 mathematics departments in the University of London with a total staff of nearly 200, and while London is in the middle of merger mania, there has so far been no suggestion that we form just one department - even less that I should be its head. I only claim to be head of one of these departments - at Queen Mary College.

Pity that Mrs Midgely should be the philosopher Ryan on the first floor in a futile attempt to rescue her blazing granny on the fifteenth. In which case we are all already in hell. And a good riddance to you too (or two).

Yours faithfully,
THABISO TATANE,
11 Park Drive,
Golders Green, London.

finance for research studentships contracting, more people may find themselves obliged to register part-time for research probably leading, in the first instance, to a masters. Given this situation, I would like to suggest that the question of the distinction between a taught masters, a masters by research, and a PhD by research is likely to become increasingly pertinent and should therefore be considered at length and specified in detail by universities for the sake of students and their supervisors.

Meanwhile, given five and a half years work invested and the number of domestic and economic problems already encountered, I agreed last March to rewrite as suggested for resubmission this autumn. I even gritted my teeth a few weeks ago and feel I have long since outgrown. Then, at the end of June, I received formal notification of the examiner's decision from the Committee of Higher Degrees with the note that resubmission would cost £1166 (since re-examination (postage costs, travel...) can hardly cost this much, clearly a specific penalty is involved, and that penalty falls on me, not on my department, my supervisors, or on anyone else involved. Given part-time, hourly paid work it is not easy to find such a sum of money (I already have a debt to the university in relation to initial typing costs). Furthermore, the whole episode has come to feel like a case of "blaming the victim". There has been no formal contact from the sociology department, no statement of sympathy other than the odd informal comment passed back to me through one of my supervisors, no gesture of support.

One of my supervisors has, in fact, ventured to comment that it may have been a tactical error on their part not to have argued for upgrading since the external examiner's comments are taken recognition while still expressing her reservations in relation to my work. But should recognition of postgraduate work be contingent upon correct tactics? While hardly an original observation, it is perhaps worth commenting that the completion and successful submission of a dissertation is no direct or adequate measure of the quality of candidate. However, recognition of inadequacies in the system does not really alleviate the shock of rejection of months of writing and several years of work.

Overall, therefore, perhaps we should be surprised not at the low proportion of projects that reach the stage of submission in dissertation form, but at the fact that any ever reach that stage at all. In my case it has felt like a hurdle race with an unpredictable number of hurdles and very little support from the university as backer. I think that I have fallen at the last fence - or is it the last? If I were to rewrite and pay my resubmission fee, I might simply find yet a further hurdle waiting to be erected!

Yours faithfully,
LIZ WEBBS,
ex-department of sociology,
Bristol University.

TUC general council

Sir, - I noticed with interest your report on the elevation of Mrs Lil Stevens to the TUC general council. I must, however, correct one piece of information given in that report. Mrs Stevens is not a member of the Birmingham City Council's education committee. She was nominated to that position by the Birmingham Trades' Council in May 1982 but failed to attend any meeting during the municipal year 1982/83. The Birmingham Trades' Council have now nominated a new member.

Yours faithfully,
B. J. MEADOWS,
Chairman, Birmingham City Council Education Committee.

Scots talk

Sir, - I should explain that the conversations with elderly Scots (THESE, August 19) were back in the 1930s; I doubt if there are any survivors of the Robertson Nicol era today.

Yours etc.
JOHN GILLARD WATSON,
32 Beech Croft Road,
Oxford.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to cut or amend them if necessary.

Union monopolies

Sir, - I noted a recent letter in your correspondence columns suggesting that the Inner London Education Authority is maintaining a monopoly in favour of the National Association of Teachers in Further and Higher Education (THESE, July 29).

This of course is not the case, there are three associations with union functions represented on a number of committees of the ILHA dealing with such matters as conditions of service or advising the education committee and the chief education officer through the standing advisory committee for further and higher education.

These three associations are: The National Association of Teachers in Further and Higher Education; The National Society for Art Education (representing many staff concerned with Art and Design); The Association of Principals.

It is important to state the actual situation to prevent mistaken concepts or myths taking root.

Yours faithfully,
A. SAUNDERS,
Immediate Past President,
The National Society for Art Education.

Commonwealth report

Sir, - Grateful as we must be to you for your special number on the Commonwealth universities, I wonder whether some of the things that are said in it will altogether endear you to our Commonwealth friends.

For example, in your contents list on page 15, Ghana comes out as Guyana. Also, the section on Nigeria on page 22 seems to have been written by someone with no knowledge of that country! Bayero is not a place, but the name of the University at Kano. The University of Nigeria, which you say "is also based in the capital" along with the universities of Lagos and Ife, is of course the University of Ife. It is not in the capital; it is at Ife.

Possibly some colleagues may not know what you have done with the French proverb which begins *Plus ça change...*

Yours sincerely,
J. D. FACE,
Professor of African History,
The University of Birmingham.

Sir, - I refer to the article on Hongkong in the special report "Commonwealth Universities Today" (THESE, August 12).

The UK-HK Joint Funding Scheme is designed to assist Hongkong students on first degree, HND, TEC HD and BEC HND courses, not post-graduate students, as stated in the report. Successful applicants will receive assistance in meeting the difference between the home and the overseas rates of fee.

Yours faithfully,
M. BLITON,
Selling Student Adviser,
Hongkong Government Office,
6 Grafton Street,
London.

Private degrees

Sir, - The University of Buckingham can now award university degrees rather than diplomas and yet it could not exist during the summer term without a massive influx of part-time lecturers from other universities. What kind of academic integrity does this represent? If a body purporting to call itself a university cannot exist in its own right, with its own full-time staff, we might as well allow the Government to render all academics redundant.

Yours sincerely,
GILBERT ROCKETT,
The Grove,
Relscroft Avenue,
Northwich,
Cheshire.

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George R. Stewart

The author is president of the Scottish Further Education Association.

The threat of further uncertainty

Change has been part and parcel of the work in further education for the last 25 years. The ability of the further education service to adapt in response to the changing needs of industry, commerce and the community has always been its strong point. The next few years, once again, promise that there will be a need to change but what is different, is the amount of uncertainty which exists in the Scottish system today.

In the past few weeks the Secretary of State for Scotland has pronounced on the report of the Council for Tertiary Education. In his statement Mr George Younger talks of transferring three colleges from the local authority to the centrally funded sector on the strength that these colleges are involved primarily in the provision of advanced level courses. There has not however been any clear statement as to what will happen to the colleges currently being taught in further education colleges not involved in the proposed alterations to the structure. Is it the intention of the Scottish Education Department to transfer all advanced courses to the centrally funded sector? If this is the case, will the staff currently involved in the teaching of the courses be offered employment in the colleges to which the courses are transferred? Those are questions which are causing a great deal of concern in local authority colleges. One of the major advantages of the present system is the comprehensive provision made by further education colleges enabling students to enter the system at the level appropriate to them and continue their studies in the same college. There is also the advantage that highly qualified staff can be used for both advanced and advanced courses. Any change which would mean better qualified staff seeking employment elsewhere would be a disaster for further education.

There is a Youth Training Scheme. With the official start date a matter of days away, many colleges still do not know what demands are going to be placed on them. This has been partly due to the differences in opinion which have existed over the fees to be charged for the "off the job" element of any scheme. The Convention of Scottish Local Authorities have now determined a rate of £1.19 per student hour which is considerably higher than the rate being charged in England. Many firms are not prepared to pay this amount with the result that there has been a boom in business for the private sector who are cashing in on the YTS. Perhaps now is the time for local authorities to recognize that they are now in a commercially competitive situation and should respond by using business methods. The success of any business depends on getting the right product on the market at the right time and price. If a competitor appears to be securing a large market share through pricing policy then such a challenge has to be met. There is no doubt that the resources are available within further education to meet the needs of trainees but the price is out of line with that of competitors. Unless this is rectified then an increasing amount of further education work will go to the private sector.

There is a real danger that further education could lose the advanced courses to centrally funded colleges and the YTS work to private enterprise. This could leave the existing courses up to ONC/OND level. The Scottish Education Department's 16-18 in Scotland - An Action Plan proposes considerable alterations to this type of course with perhaps some of the work being done in schools.

Further education must continue to provide a comprehensive service to industry, commerce and the community at all levels. To allow this to be done, the areas of uncertainty must be removed so that plans can be made to meet the changing needs of those present and potential users.

George R. Stewart

The author is president of the Scottish Further Education Association.